
Preliminary Assessment

Kittridge Distribution Center
4959 NW Front Avenue
Portland, Oregon

Prepared for
Schnitzer Investment Corp.

April 5, 2000

BRIDGEWATER GROUP, INC.

USEPA SF



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SECTION 1

INTRODUCTION

This Preliminary Assessment (PA) report presents the results of a PA performed for the Schnitzer Investment Corp (SIC) Kittridge Distribution Center at 4959 NW Front Avenue in Portland, Oregon (Site) (Figure 1-1). This PA was performed in response to a December 14, 1999 Strategy Recommendation received from the Oregon Department of Environmental Quality (DEQ). The DEQ Strategy Recommendation was accompanied by a demand from DEQ that SIC perform a Preliminary Assessment with sampling on the Site.

1.1 Purpose of the Preliminary Assessment

The purpose of the PA is to assess the potential for releases of hazardous substances to have occurred at the Site and for the releases, if they have occurred, to have migrated to the Willamette River sediments and caused a threat to human health or the environment. Based on the December 14, 1999 DEQ Site Strategy Recommendation for the Site, the contaminants of interest (COIs) in the Willamette River sediments near the Site are:

- Barium
- Cadmium
- Lead
- Mercury
- Silver
- Zinc

This PA specifically assesses the potential for these COIs to have been released on the Site during SIC's ownership of the site and to have migrated to the Willamette River.

1.2 Scope of Preliminary Assessment

The PA was performed by reviewing available historical information, performing a site reconnaissance, reviewing available regulatory agency file information, and interviewing available persons familiar with the current and past site operations. Specific sources of information reviewed included:

- Sanborn Fire Insurance maps from 1950 and 1969.

- Aerial photographs from 1936, 1940, 1948, 1956, 1957, 1961, 1963, 1972, 1977, 1980, 1986, 1991, 1995, and 1998.
- Oregon Department of Environmental Quality hazardous waste, environmental cleanup, and underground storage tank files.
- SIC environmental files.

A site reconnaissance visit and a drive-by observation of the adjacent properties were performed on March 2, 2000. Representatives of SIC and the current property tenants were interviewed during the site visit.

1.3 Summary of Preliminary Assessment

Based on the absence of migration pathways from the Site to the Willamette River, there is no evidence of ongoing migration of COIs from the Site to the Willamette River. The Site is currently almost entirely covered with buildings and asphalt pavement. There is no source for COIs in the storm water runoff under the current site conditions. Past groundwater sampling had demonstrated that COIs are not migrating through the groundwater toward the Willamette River. The presence of buildings, pavement, and clean landscape fill prevents migration of any soil from site that may have elevated concentrations of COIs to the Willamette River.

No further assessment, including additional soil, groundwater, or surface water sampling is necessary.

SECTION 2

RECENT CONDITIONS AND OPERATIONS

This section presents the recent conditions and operations on the Site and the adjacent properties. For the purposes of this PA, locations and relative directions of site features will be described assuming that the Site is oriented north-south with NW Front Street being the north side of the Site and NW Kittridge Avenue being the east side of the Site.

2.1 General Area Conditions

The Site is an approximately five-acre site located in an industrial area of northwest Portland. The land around the Site is used for industrial activities and businesses. The Site is located in an area designated as the Guilds Lake Industrial Area and past attempts to develop commercial businesses have been denied in order to maintain the industrial nature of the surrounding area. The nearest residence is over ½ mile away from the Site. Public sewer has been provided to the Site since 1971.

Immediately south of the Site are Burlington Northern mainline railroad tracks with a light industrial warehouse located south of the rail tracks. A rail spur is located adjacent to the western boundary of the Site. A Chevron asphalt refinery is located about 1,000 feet west of the Site, across vacant property. Northwest Front Avenue is located along the northern boundary of the Site. The Tube Forgings, Lone Star, and Hampton sites (collectively referred to as the Front Avenue LLP properties) are located northwest of the Site, across NW Front Avenue. Shaver Transportation is located north of NW Front Avenue. Lakeside Industries is located northeast of the Site, across the intersection of NW Front Avenue and NW Kittridge Avenue. The NW Kittridge Avenue bridge structure is located along the eastern boundary of the Site.

A USGS Map showing the regional topography is presented in Figure 2-2. A 1998 aerial photograph of the Site and surrounding area is presented in Figure 2-3. Photographs of the Site are presented in Appendix A.

2.2 Soil and Groundwater Conditions

2.2.1 Regional and Local Geology and Hydrology

Geological material under the site consists of Willamette River flood deposits which are underlain with Columbia River Basalt. Soils generally consist of fine sand and silty sand. Groundwater flow direction at the site is inferred to be to the north, toward the Willamette River. Shallow groundwater is 10 to 15 feet below the existing ground surface.

2.2.2 Groundwater Use

There are no water supply wells or monitoring wells located on the Site. The closest industrial water supply well appears to be located on the Chevron property, about ½ mile from the Site. This well is 310 feet deep and founded in the Columbia River Basalt. The Site is served by the local public water supply system and sewer system. The nearest public water supply well is located over 2 miles from the Site. Based on the original construction drawings for the building on the Site, the Site area has been serviced by public water since before 1942. Public sewer service has been provided to the Site since the early 1970s.

Because of the relatively low hydraulic conductivity of the subsurface soil in the Site area, shallow groundwater wells do not produce significant quantities of groundwater. Notwithstanding the expected low production from the shallow groundwater zone, the lack of any significant landscape areas in the Site area indicates that it is not reasonably likely that anyone will use shallow groundwater in the future for irrigation.

2.2.3 Hydrologic Setting

The primary surface water body near the Site is the Willamette River, located approximately 0.1 miles north of the Site. No surface waters are present on the Site.

The site is located in an industrial area and much of the ground surface in the surrounding area is paved or covered with gravel. The 2-year, 24-hour rainfall in the Portland area is about 2.4 inches (BES July 1999 Storm Water Management Manual). Storm water in the site area either infiltrates into the ground or is collected in catch basins and conveyed in the local storm water system.

Catch basins on the Site and along NW Front Avenue drain into the City of Portland storm sewer system that eventually discharges to the Willamette River at Outfall 19. Outfall 19 is located off of the Shaver Transportation dock near River Mile 8.3. This storm water system collects storm water runoff from Front Avenue and several industrial properties along Front Avenue including the Chevron asphalt refinery, Tube Forgings, Willamette Industries, Shaver Transportation, Lakeside Industries, Calbag Metals, and Gunderson. This storm drain system also drained the WWII ship-building housing area previously located west of the Site.

The Site lies above the 100-year Willamette river flood plain. The slope of the Site area is generally flat.

2.3 Kittridge Distribution Center

The Site is currently used for a commercial and light industrial business park. Over 90 percent of the Site is either paved or covered with concrete

buildings. The site is fenced with the only opening to the Site through the driveway off of NW Front Avenue.

The business park consists of three buildings. Building A, located in the northwestern portion of the Site is about 29,700 square feet. Building B, located in the northeastern portion of the Site is about 16,100 square feet. Building C, located in the southern portion of the Site is about 57,100 square feet. All of the buildings consist of concrete tilt-up buildings with flat roofs. Very limited landscaping is present along the northern edge of the Site between the buildings and NW Front Avenue.

No evidence of existing underground storage tanks (USTs) was observed during the site visit.

The three buildings have been occupied by the same seven tenants since the business park was opened in 1996. The tenants and a description of their operations is presented below. Figure 2-1 shows the three buildings and the individual spaces leased by the seven tenants. Photographs of the tenant spaces are presented in Appendix A.

2.3.1 Colour Systems

Colour Systems receives and distributes inks to customers including printing companies. Most of the inks are oil-based. Colour Systems also mixes and repackages ink to customer specifications. Most of the area is used for storage of ink and ink additives. Several hundred containers of ink, ink additives, and ink solvents, ranging in size from one pint to 55-gallon drums, are neatly stored on pallets and shelves in the Colour Systems space. The concrete floor was clean and no evidence of significant spills of ink was observed in the storage area. No significant cracks or floor drains were observed. The Colour Systems area is about 5,500 square feet.

Ink solvents are also stored and used in the Colour Systems space. These include naphtha and toluene-based solvents. No chlorinated solvents were noted during the review of the MSDS information. The facility personnel were not aware of any previous use of chlorinated solvents. Some of the inks contain cobalt and manganese for color additives.

MSDS information for the large number of inks at the facility typically noted propylene glycol, 2-butoxy ethanol, mineral oil, and naphtha as constituents in the ink and ink solvents.

Inks are mixed in two ink mills located near the center of the Colour Systems space. The mills are water-cooled with a 10 ft by 3 ft by 2 ft-deep water trough serving as a water cooling bed. Some ink staining was observed around the base of the ink mills. Given the lack of floor cracks or floor drains, the staining does not indicate releases to the underlying soil. No evidence of spills from the water-cooling system was observed.

Wastes generated by Colour Systems primarily consist of waste inks and waste ink solvents. Facility personnel noted that about nine drums of waste ink and waste solvent are generated each month. Based on waste

profile information provided by the facility personnel, the waste is designated as non-hazardous. Safety Kleen is contracted to properly dispose of the waste offsite. There was no evidence of releases observed in the Colour Systems space. No ink or solvent wastes are discharged to the sanitary sewer.

2.3.2 WorldCom

The WorldCom space is used as a general equipment and supply storage area in support of WorldCom's maintenance of telecommunication cables in the Portland area. Trailer-mounted generators and large spools of telecommunication cables are stored in the approximately 5,800 square foot space. No equipment maintenance is performed in the space and hazardous substances are limited to small quantities (less than 5-gallons) of lubricant oil, gasoline, antifreeze, and non-chlorinated solvents stored in a fire-proof cabinet. The floor was clean and no floor cracks or floor drains were observed. No evidence of spills or releases of hazardous substances was observed in the WorldCom space.

2.3.3 04 Controls

04 Controls receives and distributes small electrical switching components. Personnel computer equipment and cables are also stored in the approximately 4,900 square-foot 04 Controls space. No equipment maintenance or assembly is performed in the space. Hazardous substances are limited to household quantities of cleaning supplies. The floor was clean and no floor cracks or floor drains were observed. No evidence of spills or releases of hazardous substances was observed in the 04 Controls space.

2.3.4 Midwest Signs

Midwest Signs receives and distributes printing and graphic supplies for a wide-range of print media service providers. Several hundred containers of oil-based and water-based inks and solvents are neatly stored on pallets and shelves in the space. No materials are mixed or repackaged in the approximately 13,100 square-foot space. No manufacturing occurs in the space and containers are not opened. A brief review of the several hundred MSDS's on file at the facility noted organic solvents, acetone, toluene, and oil-based solvents. Other than small aerosol cans of cleaners, no chlorinated solvents were observed in the space. The floor was clean and no floor cracks or floor drains were observed. No evidence of spills or releases of hazardous substances was observed in the Midwest Signs space.

2.3.5 Applied Industrial Technologies

Applied Industrial Technologies receives and distributes a wide range of small industrial parts including belts, nuts, bolts, gaskets, and bearings. No manufacturing or repackaging is performed in the approximately

11,100 square-foot space. About fifty 5-gallon containers and 40 smaller containers of lube oil were observed stored on pallets and shelves.

Two Safety-Kleen cleaning tanks were observed along the southern wall of the Applied Industrial Technologies space. Facility personnel noted that the tanks are used to clean bearings for customers. Safety-Kleen regularly services the cleaners and manages the wastes off site. No evidence of spills or releases was observed around the two cleaning tanks.

The floor was clean and no floor cracks or floor drains were observed. No evidence of spills or releases of hazardous substances was observed in the Applied Industrial Technologies space.

2.3.6 Uniq Distributing

Uniq Distributing receives and distributes decorative household tile and tile installation supplies to builders and contractors. In addition to numerous cases of ceramic tiles, floor caulking and tile adhesive are neatly stored on shelves and pallets in the approximately 5,500 square-foot space. No manufacturing occurs in the space and no materials are repackaged. The floor was clean and no floor cracks or floor drains were observed. No evidence of spills or releases of hazardous substances was observed in the Uniq Distributing space.

2.3.7 Oregonian

The Oregonian space is used to store and insert daily newspaper advertising and feature inserts. Most of the approximately 57,100 square-foot space is used to store the newspaper inserts with the inserting operation being performed in an area in the western portion of the space. The insert machines are operated using compressed air with the air compressors located in the northwest corner of the space.

Less than ten 5-gallon containers and one 55-gallon drum of transmission oil and lube oil were observed in the northwest area of the space, near the air compressors. A fenced area along the western wall of the space is used to store hand tools and small quantities of paints, non-chlorinated solvents, and phosphate-based floor cleaner.

Two floor drains are located near the air compressors, along the western wall of the space. Lines conveying water drained from the air compressors drain into the floor drains. One of the floor drains is also used to drain the floor cleaning equipment after each use. Facility personnel noted that the floor drains are connected to the City of Portland sewer systems. Some discoloration was observed around the lines draining the air compressors. No floor cracks or other floor distress was observed in the area around the air compressors or in any other portion of the Oregonian space.

No evidence of spills or releases of hazardous substances was observed in the Oregonian space.

2.4 West of Kittridge Distribution Center

A railroad spur is located immediately west of the Site. The area between the spur and NW Front Avenue is currently used by Lone Star to park dump trucks. The area is unpaved and covered with gravel. A Chevron asphalt refinery is located about 1000 feet west of the Site. The asphalt plant includes numerous large above-ground storage tanks. Petroleum products are stored in the tanks and the tanks are connected with numerous above-ground pipelines. Storm water runoff from the area west of the Site either infiltrates into the ground or is collected in catch basins and conveyed in the buried storm drain lines beneath NW Front Avenue.

2.5 South of Kittridge Distribution Center

A SFPP rail yard borders the south side of the Site. The rail yard is about 150 feet wide. A light industrial warehouse business building is located south of the rail yard, about 230 feet south of the Site. West Coast Paper and Madden Fabrication occupy the building. The building is surrounded by pavement on the west, south, and east sides. Storm water runoff from the building is conveyed through the storm water system beneath NW Yeon Avenue.

2.6 East of Kittridge Distribution Center

The elevated bridge structure for NW Kittridge Avenue is located immediately east of the Site. The areas beneath the bridge and west of the bridge are occupied by Calbag Metals. Calbag Metals collects and recycles ferrous and nonferrous metals. Metal is collected and processed for future recycling. Processing operations include cutting and torching. Collected metal is stored in outside bins located beneath the bridge structure and along other portions of the Calbag site perimeter. Storm water from the Calbag Metals site is collected in catch basins and conveyed through the buried storm water line beneath NW Front Avenue and eventually discharges to the Willamette River at City Outfall 19 near the Shaver Transportation dock.

2.7 North of Kittridge Distribution Center

Tube Forgings, Lone Star, Hampton Industries, Shaver Transportation, and Lakeside Industries are located north of the Site across NW Front Avenue, between NW Front Avenue and the Willamette River. Many of these facilities include use and handling of hazardous substances, including the Willamette River sediment COIs.

2.7.1 Tube Forgings

Tube Forgings machines pipe. Most of the area around the main building is paved. The portion of the property visible from the public right-of-way consisted primarily of paved parking areas. The northern portion of the Tube Forgings area appears to be unpaved in the 1998 aerial photograph. The area between the main building and NW Front Avenue is used for pipe storage. Storm drains along NW Front Avenue drain to the buried storm drain lines beneath NW Front Avenue and eventually discharges to the Willamette River at City Outfall 19 near the Shaver Transportation dock. Storm water runoff from the northern portion of the property is conveyed to the Willamette River through a private outfall near river mile 8.1.

2.7.2 Lone Star

Lone Star operates a concrete batch in the area between the Tube Forgings property and the Willamette River. Based on DEQ file information, sand and gravel is offloaded from barges onto the property. It is unclear whether the property is paved. DEQ reports that there are five drywells that are used to infiltrate storm water runoff into the ground. DEQ also reports that chemical contaminants do not appear to be used at the Lone Star facility.

2.7.3 Hampton Industries

The Hampton property is used to store and distribute lumber products. Based on the 1998 aerial photograph, it appears that essentially all of the Hampton area is paved. Although it is not shown on the City of Portland storm sewer drawings, catch basins in the Hampton area are presumed to drain to the City Outfall 19 located immediately east of the Hampton property. The lack of current regulatory agency files and the current use of the property suggests that the facility does not use significant quantities of hazardous substances.

2.7.4 Shaver Transportation

The Shaver Transportation property is used as a boat docking and servicing facility. The facility includes three docks, a barge-mounted shop, and two small buildings. Several vessels are observed adjacent to the Shaver facility docks in a recent aerial photograph. Based on a recent aerial photograph, most, if not all, of the upland portion of the Shaver property is paved. Based on DEQ file information, Shaver performs over-water maintenance of their tugboats, including oil change-outs and cleaning.

2.7.5 Lakeside Industries

Lakeside Industries operate a hot-mix asphalt plant northeast of the Kittridge Distribution Center property. The hot mix operation includes

heating petroleum asphalt materials and mixing with crushed aggregate. Based on DEQ file information, the Lakeside Industries facility includes a 2,500-gallon waste oil tank, a 15,000-gallon above ground diesel tank, and a dry well. Waste asphalt is reportedly stored adjacent to the Willamette River shoreline. Based on the presence of a dock at the facility, it appears that aggregate and, possibly, asphalt materials are transported to the facility using barges. Offices and maintenance buildings are located in the uplands portion of the property. The northern half of the property, between the mix plant and the Willamette River is used for aggregate storage.

SECTION 3

SITE AND SURROUNDING AREA HISTORY

This section summarizes the history of the Kittridge Distribution Center property and the immediate surrounding properties. The site history is based on the review of the Sanborn Fire Insurance maps, historical aerial photographs, review of available regulatory agency files, and interviews with SIC representatives.

3.1 Kittridge Distribution Center

3.1.1 Operations Prior to SIC Ownership of Site

The Site was first developed in the 1942 as an acetylene production facility. Air Reduction Sales Company purchased the property from the City of Portland in 1942. A succession of companies operated the acetylene production facility until 1991. These companies produced acetylene by reacting water with calcium carbide. The reaction produces acetylene and lime. The lime was discharged to a lagoon located in the north-central portion of the site. The lime was then sold to local farmers as a soil admixture. Acetylene was dissolved in acetone which was stored in an underground storage tank located south of the main building. The acetylene/acetone mixture was placed in metal cylinders and sold.

The facility also received and distributed other gasses such as argon, oxygen, nitrogen, carbon dioxide, propane, ammonia, and methane. These gasses were not manufactured on the Site but were stored and distributed.

A 1961 aerial photograph shows the addition of a small building in the southwest corner of the site, the gas refilling building. In 1972, the acetylene storage facility was removed. A 1986 aerial photograph shows the addition of the covered loading dock attached to the gas refilling building. Other than the changes previously noted, the aerial photographs from 1956, 1957, 1961, 1963, 1972, 1977, 1980, and 1986 show no major changes to the site configuration and lime lagoon.

A 1950 Sanborn Fire Insurance map indicates that Air Reduction Pacific operated 24 hours per day on the site. A rough plot plan of the facility shows three warehouses, a brick building, a gas holding tank, and a railroad spur. The two smaller warehouses are located on the west side of the site. The railroad spur crosses the south side of the site adjacent to the two small warehouses. The brick building located in the southeastern corner of the site has both a boiler room and a fuel room. A large warehouse is located on the eastern portion of the site. The adjacent properties are undeveloped.

The Sanborn Fire Insurance map dated 1969 indicates that Air Reduction Pacific changed in the following ways:

- A small warehouse in the southwestern corner adjacent to the railroad spur is a lime warehouse.
- A kiln conveyor was added between the lime warehouse and a new building and cyclone north of the lime warehouse.
- A large warehouse north of the large warehouse on the eastern portion of the site was added.

City directories for 1936, 1950, 1955, 1965, 1973, 1980, 1985, and 1995 were reviewed to assess the types of businesses present on the subject property and immediately adjacent surrounding properties. The subject property first appeared in the directories in 1950. The property was first listed as Air Reduction at 4959 N.W. Front Street. From 1950 through 1965, the subject property remained listed as Air Reduction. In 1973, the subject property was listed as Airco Welding. Area properties have been occupied by business entities indicating commercial and industrial uses since 1936.

Figure 2-4 presents the acetylene facility site layout just prior to the Site being developed for use as a scrap metal handling facility (1991). A 1990 report by Earth Technology Corporation notes that the plant stopped producing acetylene (and presumably stopped producing lime by-product) in 1985. The acetylene generation facilities were demolished in 1989. In a 1991 aerial photograph, site alterations included the removal of structures from the southeastern portion of the site.

An approximately 300-ft deep water supply well was located on the Site during the operation of the acetylene plant. USGS information indicates that the well was drilled and constructed in 1942 with an 8-inch diameter casing. Figure 2-4 shows the location of the water supply well.

The acetylene generation facility included a septic tank in the southeastern portion of the Site and a dry well immediately west of the cylinder test shop. Acetylene cylinders were painted in a paint shop with oil-based paints. The primary hazardous constituents used on the Site during the acetylene generation activities were volatile organic compounds associated with the acetylene packaging (acetone) and acetylene cylinder cleaning and painting (paints and solvents). No significant machining or metal-working is believed to have been performed on the Site. Activities generating wastes containing significant quantities of Willamette River COIs are not known to have occurred on the Site during operation of the acetylene plant.

Airco obtained a Waste Disposal Permit from DEQ in 1983 for the placement of the lime by-product in the lagoons. Inspections of the lagoon in 1984, 1985, and 1986 did not indicate any offsite migration of the lime material.

The site was acquired by Crawford Street Corporation (CSC) in 1991 from Northwest Airgas, Incorporated and was reconfigured for use as a scrap metal transfer facility. Figure 2-5 shows the facility features while

the site was used as a scrap metal recycling receiving yard (Asset Recovery). The lime lagoon was not present in a 1995 aerial photograph and the site was partially paved with four one-story structures.

According to an interview with Charlie Neal of Asset Recovery on September 15, 1995, Asset Recovery paved the southern portion of the site, installed the connecting road under the Kittridge Avenue bridge structure, and installed a scale. Mr. Neal noted that Asset Recovery used the site for sorting scrap metal products for shipment to offsite locations. Scrap metal was stored in sort bins and roll-off boxes that were located on asphalt pavement. No scrap metal processing (e.g. crushing, shredding, or shearing) was performed on the property.

A fueling station where trucks and equipment were fueled was located in the southeast portion of the Site. A 500-gallon above-ground diesel storage tank was located in this area. The tank included internal secondary containment. Mr. Neal did not report any significant spills or releases on the Site, including the former fueling station.

Shortly after acquiring the property in 1991, Asset Recovery paved much of the Site and installed a storm water collection system. The storm water collection and conveyance system present on the Site during the Asset Recovery operations is shown in Figure 2-5. As noted on the figure, numerous catch basins were located in the paved areas. The catch basins included sediment traps to minimize particulate matter from being transported off of the Site with the storm water runoff. Filter pads were also used around the catch basins to prevent runoff of suspended particulates.

Asset Recovery obtained an NPDES 1200-R storm water permit for the Site in September 1991. In June 1993, Asset Recovery prepared a Storm Water Pollution Control Plan as part of the permit requirements. The permit included specific discharge criteria for Oil & Grease, pH, and toxicity. The permit requirements also included semi-annual discharge monitoring for arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc. Asset Recovery completed the required monitoring up through 1995 when they ceased operations on the Site and a storm water permit was no longer needed. The results of the monitoring were submitted to DEQ. The NPDES permit expired in September 1996.

3.1.2 Operations During SIC Ownership of Site

SIC acquired the Site from CSC in February 1996. SIC demolished all of the structures on the site in Spring 1996 and constructed the three warehouse buildings comprising the current Kittridge Distribution Center development. The construction included paving most of the site and installing a storm water collection system meeting City of Portland requirements. As noted in Section 3.1.3, SIC performed several environmental investigations and remediation activities during the Site redevelopment. Seven commercial and light industrial warehouse tenants occupied the buildings in 1996 once construction was completed.

Demolition and site grading activities included significant regrading of surface soil. Except as discussed in Section 3.1.3, evidence of soil contamination was not observed during site demolition and grading. Specifically, evidence of soil contamination was not observed in the fill from the local quarry, during the site grading, and around the septic tank removed from the southeast corner of the site.

Since SIC's ownership of the site, there have been no known releases of hazardous substances to the Site soil or groundwater. No evidence of migration of COIs from the site to the Willamette River has been observed.

3.1.3 Environmental Investigation and Cleanup Activities

Several environmental investigation and remediation activities have been performed on the Site. Each of these is described below. Copies of the relevant reports have been previously provided to DEQ.

3.1.3.1 Investigations and Remediation Prior to SIC Ownership

Three environmental investigations and remediations are known to have been performed on the Site prior to SIC's ownership of the Site. Reports were prepared for each of these and the activities are summarized below:

1989 Removal of Underground Storage Tanks

Two underground storage tanks were removed from the Site in 1989. A 1500-gallon acetone tank was located south of the former office building in the eastern portion of the Site. A 1000-gallon heating oil tank was located near the boiler building in the southeastern portion of the site. No distress in the tanks or evidence of releases was observed in the tank excavations. Figure 2-4 shows the location of these former underground storage tanks.

One soil sample was collected from the bottom of the acetone tank excavation and analyzed for acetone. Acetone was not detected at a reporting limit of 0.2 mg/kg in the soil sample. Two soil samples were collected from the bottom of the diesel tank excavation and analyzed for petroleum hydrocarbons. Petroleum hydrocarbons were detected at concentrations of 100 and 190 mg/kg in the two samples. Both of these concentrations are less than the Level 2 DEQ soil cleanup matrix concentrations applicable to the Site.

The tank removal work was directed by Northwest Environmental Corporation (NEC). NEC prepared an August 25, 1989 report titled "Report on the Removal and Investigation of Two Underground Storage Tanks: at Northwest Airgas, Incorporated, 4959 N.W. Front Avenue, Portland, Oregon."

1990 Environmental Site Assessment

In 1990, The Earth Technology Corporation (TETC) performed an environmental site assessment on the Site. The assessment included a review of the site history, a site reconnaissance, and collection and

analysis of soil and groundwater samples. The results of the assessment are presented in an August 30, 1990 report by TETC titled "Report on an Environmental Site Assessment of Property Located at 4959 N.W. Front Avenue, Portland, Oregon, for Northwest Airgas, Incorporated."

The report states that the site has been used as an industrial gas filling, distribution, and acetylene generation facility throughout its history. No other industrial activities are known to have occurred at the site beyond a lime distribution business associated with the production of acetylene.

Seven soil samples were collected and analytical results noted total petroleum hydrocarbons (TPH) in the soil at concentrations up to 2,600 mg/kg. Polychlorinated biphenyls (PCBs) were not detected in the soil samples. The high TPH sample represented a small area (approximately 6 ft x 10 ft x 3 ft deep). This soil was subsequently removed from the Site during the 1991 remediation.

The report summarized previous sampling and analysis of soil from the former lime pond area. The previous soil samples were analyzed for total metals, pH, and EP tox metals. Total chromium concentrations ranged from less than 10 mg/kg to 37 mg/kg. Total lead concentrations ranged from 10 to 400 mg/kg. Total zinc concentrations ranged from 120 to 3100 mg/kg. The pH of the soil was alkaline with a pH greater than 11. The EP Tox concentrations of metals was reported to be "...orders of magnitude below the maximum level." The "maximum level" was the EPA hazardous waste designation concentration for characteristic hazardous waste.

Surface wipe samples of stained concrete noted PCB concentrations ranging from "non-detected" to 9.6 ppm.

Groundwater samples were collected from five temporary shallow wells drilled to a depth of about 15 feet on the Site. Figure 4-1 shows the location of the temporary groundwater well sampling locations.

The groundwater samples were analyzed for petroleum hydrocarbons, volatile organic compounds, and metals. Petroleum hydrocarbons were not detected in any of the groundwater samples. Acetone was detected in one sample at a concentration of 17 mg/L. Methyl isobutyl ketone (MIBK) was detected in one sample at a concentration of 4.6 mg/L.

Table 3-1 presents the results of the groundwater analysis. As shown on the table, metals were detected in each of the groundwater samples. However, all of the groundwater samples were reported to be turbid as the samples were collected from temporary wells and without any well sand packs or well development. The sample with the highest reported turbidity also had the highest measured metal concentrations (MW-4). Based on the high turbidity of the groundwater samples, TETC concluded that the measured metal concentrations represent the suspended particles in the groundwater samples and do not represent dissolved concentrations. The lack of representativeness of the measured metal concentrations due to the suspended sediment was confirmed by subsequent groundwater sampling and analysis performed in January

1996. Further discussions of the groundwater sampling and analysis results are presented in Section 4.2.1.

An approximate measurement of the relative groundwater elevations in the temporary wells indicated a groundwater flow direction toward the Willamette River.

1991 Environmental Site Assessment and Remediation

In 1991, limited excavation and offsite disposal of petroleum-contaminated soil was performed. The results of the soil excavation were presented in a January 24, 1991 TETC report titled *Summary Report for an Environmental Site Assessment and Remediation of Property Located at 4959 NW Front Avenue*.

Near surface soil in the area represented by the 1990 soil sample with 2600 mg/kg petroleum hydrocarbons was excavated to a depth of about 18 inches. This area was located in the narrow area between the Cylinder Refilling Room and the Compressor and Paint shop Storage Room (See Figure 2-4). The total volume of soil excavated was not reported, but the excavated soil was placed in drums, suggesting that the volume of soil was limited. A soil sample collected from the bottom of the excavated noted a petroleum hydrocarbon concentration of 2800 mg/kg. The report noted that "...additional excavation will be required." TETC concluded that the extent of remaining soil with petroleum hydrocarbons was minimal given the close proximity of existing buildings. As discussed in a subsequent section of this report, evidence of remaining contaminated soil in this area was not observed during the 1996 site redevelopment and remediation work by SIC.

Analysis of the excavated soil for disposal purposes noted low concentrations of toluene, xylene, and 1,1,1-trichloroethane. PCBs were not detected in the excavated soil sample and TCLP metal concentrations were less than hazardous waste designation levels.

3.1.3.2 Investigations and Remediation During SIC's Ownership

Soon after SIC acquired the property, SIC performed several environmental investigations and remediations. These activities are described below.

September 1995 Environmental Site Assessment

In 1995, CH2M HILL performed an environmental site assessment at the Kittridge Distribution Center site. The assessment included a site history review, a site reconnaissance, and a review of the previous environmental assessment and investigations on the Site. The results of the site assessment were presented in a September 29, 1995 CH2M HILL report titled *Environmental Site Assessment for the Asset Recovery Property, Portland, Oregon*. Along with confirming the findings of previous site history reviews and general physical features of the site, the report states the following:

- Waste and debris piles are currently present on the site, potentially from demolition of structures at the site or regrading and paving the southern portion of the site in 1992.
- Stained soils were observed at the site during the site walk. Many small stains, were observed, mainly leaking from vehicles used onsite, equipment stored onsite, and seepage from metal sort bins on asphalt surfaces. Additionally, a 5-gallon bucket of an unknown material (it appeared to be used petroleum), was spilled in the western corner of the site and created a stain area approximately 2 feet by 8 feet and a small spill stain (approximately 2' x 2') was observed on soil near the north entrance fence.
- Site visits confirmed the "deep groundwater well" located in old compressor and paint storage room.
- The "drywell", a vertical buried 55-gallon drum, identified in the TETC report, was also confirmed during the site walk.
- Site visits confirmed stained concrete surfaces inside the compressor and paint storage room and paint shop. These stained surfaces were identified and sampled by TETC for polychlorinated biphenyl's (PCB's). Sample results indicated PCB's present at concentrations of 2.8 ppm and 9.6 ppm...
- In addition to the stained surfaces noted in TETC's report, petroleum stains were identified at the old acetylene desiccator (the site of the old acetylene generator), which is currently the location of a diesel above ground storage tank.

The report recommends that the oil stains that have not been previously characterized should be sampled and analyzed for petroleum hydrocarbons and PCBs. The report also recommends that the 300-foot-deep well be properly abandoned and that the drywell be decommissioned.

January 1996 Groundwater Assessment

In late 1995 and early 1996 CH2M HILL performed a groundwater assessment at the Site. The groundwater assessment consisted of performing Geoprobe sampling of the shallow groundwater at 11 locations on the Site. The groundwater samples were analyzed for volatile organic compounds, and dissolved mercury, arsenic, cadmium, lead, and nickel. The results of the groundwater assessment were presented in a January 26, 1996, CH2M HILL reported titled *Asset Recovery Groundwater Assessment*.

Volatile organics were not detected in any of the groundwater samples. Trace concentrations of arsenic (up to 0.014 mg/L), nickel (up to 0.0073 mg/L), and lead (up to 0.004 mg/L) were detected in several of the groundwater samples. Figure 4-1 shows the location of the 1996 Geoprobe sampling locations. Table 3-1 presents the results of the 1996 groundwater sample analyses.

April 1996 Remedial Actions

In 1996, SIC performed several environmental remediation activities on the Kittridge Distribution Center site. An April 3, 1996, report titled *Remedial Actions Completed at the Former Asset Recovery Site* was prepared by CH2M HILL summarizing the completed remedial actions. The following remedial actions were completed by SIC and summarized in the report:

- Removal of concrete previously sampled by The Earth Technology Corporation and found to contain PCB concentrations precluding disposal as demolition waste.
- Additional sampling of oil-stained concrete for the presence of PCBs to assess waste disposal requirements. Samples of the stained concrete were measured to contain 0.077 mg/kg to 0.24 mg/kg PCBs. Based on these low PCB concentrations, this concrete was subsequently disposed as a demolition waste.
- Approximately 11 cubic yards of petroleum-contaminated surface soils was excavated from two areas on the Site and disposed off site. One cubic yard of soil was excavated from near the northwest corner of the Site in an approximate 5 feet by 3 feet surface soil stain. Ten cubic yards of soil was excavated from an approximate 10 feet by 17 feet area north of the former Chem Lime building in the southwest portion of the Site. Confirmation soil samples collected from the final sides and bottom of the excavations noted petroleum hydrocarbon concentrations less than 500 mg/kg.
- Two representative samples of excavated soil and concrete were collected to determine waste acceptance at a solid waste disposal facility. The samples were analyzed for petroleum hydrocarbons, volatile organics, semi volatile organics, chlorinated pesticides, PCBs, and metals. Volatile organics and chlorinated pesticides were not detected in either of the two samples. Petroleum hydrocarbon concentrations ranged from 1700 mg/kg to 2800 mg/kg. Arsenic concentrations ranged from 16 to 28 mg/kg and lead concentrations of 74 and 110 mg/kg were measured in the samples. Phenol was detected at a concentration of 9.9 mg/kg in one of the samples. PCB concentrations in the two samples were 1.8 mg/kg and 0.94 mg/kg. Based on the sample analysis results, the material was disposed as a non-hazardous solid waste.
- Interior wall paint identified as potential lead-based paint had sloughed from some of the building walls. The sloughed paint was collected off of the building floors and analyzed for TCLP lead. The TCLP lead concentration was measured to be 3.6 mg/L and the material was disposed off site as a non-hazardous, solid waste.

The April 1996 remediation work also included an attempt to locate the area where TETC reported remaining petroleum hydrocarbon contaminated soil during their 1991 soil assessment and remediation work. No evidence of contaminated soil was observed in the reported

area of the previous soil removal. As noted in a previous section, TETC had concluded that the extent of the remaining soil was minimal.

May 1996 Soil Sampling

In May 1996, buried acetylene cylinders were encountered in the former loading dock on the Site. CH2M HILL collected five soil samples from beneath the area where the cylinders were found and removed. The samples were analyzed for volatile organic compounds. Acetone was detected in two of the five samples at concentrations up to 110 mg/kg. The measured acetone concentrations are well less than applicable cleanup levels and do not pose a threat to human health or the environment. The results of the soil sampling are presented in a May 22, 1996 CH2M HILL memorandum titled *Asset Recovery Volatile Organic Soil Sampling and Analysis*.

July 1996 Abandonment of Former Water Supply Well

In June 1996, SIC abandoned the former water supply well in the compressor and paint storage room at the Site. The well was about 309 feet deep and extended into the underlying basalt formation. The well was cased with an 8-inch diameter casing to a depth of about 74 feet. A July 10, 1996, Technical Memorandum by CH2M HILL titled *Abandonment of Former Water Supply Well* summarizes the abandonment of a former water supply well.

Septic Tank Removal

A former septic tank was encountered during the 1996 site demolition activities in the southeastern corner of the site. An environmental contractor removed approximately 69 gallons of emulsified oil and 139 gallons of oily solids from the tank and disposed of it offsite. The tank was removed and no evidence of soil contamination was observed in the soil surrounding the tank. The tank was associated with the on-site septic system and was not connected to the local storm water system.

3.2 West of Kittridge Distribution Center

3.2.1 General Site History

Aerial photographs indicate that the area immediately west of the Site was first developed in the mid 1940s as a housing project. The 1950 Sanborn Map refers to the housing project as the Guilds Lake Courts Federal Housing Project. The houses were apparently used by workers working in the World War II Portland shipyards. The rail spur currently bordering the west side of the Site is first present in the 1948 aerial photograph.

The aerial photographs also note the current asphalt refinery plant being constructed in the mid 1940s. City of Portland sewer drawings indicate that the storm water from the housing project was collected in a buried pipe along the eastern edge of the project (i.e. along the western edge of

the Kittridge Distribution Center). This storm water (and sewage?) was conveyed to the Willamette River at current Outfall 19.

Based on the historical aerial photographs, the housing project was removed in the early 1950s with only the streets remaining. This area remains vacant currently. The Chevron asphalt refinery is still present west of the Site.

3.2.2 Previous Environmental Investigations

There have been no known environmental investigations on the property immediately west of the Site.

Chevron has prepared a Preliminary Assessment for their asphalt refinery. The assessment documented soil and groundwater petroleum hydrocarbon contamination associated with the operation of the asphalt refinery for over 50 years.

3.3 South of Kittridge Distribution Center

The railroad tracks immediately south of the Site were present in the mid 1930's, prior to the initial development of the Site. The light industrial warehouse building currently present south of the railroad tracks was constructed between 1957 and 1961. This area was not developed prior to the construction of the light industrial warehouse building. There are no known environmental investigations that have been performed on the property south of the Site.

3.4 East of Kittridge Distribution Center

3.4.1 General Site History

Based on the historical aerial photographs, the Kittridge Avenue elevated bridge structure was constructed between 1940 and 1948. Prior to that time, there was no connecting road between NW Front Avenue and NW Yeon Avenue in the area around the Site.

Based on the historical aerial photographs, operations started on the property east of the Site between 1940 and 1948. The 1950 Sanborn Map notes the initial activities on the property were associated with a Kern & Kibe "Contractor's Machinery Yard." Up until 1968 when the property was started to be used for a metal scrap yard, the property operations were limited to the eastern portion of the property and the first 300 feet of property east of the Kittridge bridge structure were unused.

Between 1963 and 1972, the presently existing building on the western end of the Calbag Metals property was constructed. In 1968, Acme Metals started using the property east of the Site, including the new

building on the property immediately east of the Kittridge bridge structure, for scrap metal receiving, processing, storing, and shipping.

Based on the historical aerial photographs, most of the scrap metal operations appeared to be performed on the eastern portion of the property. However, some storage of scrap metal appears to have occurred on the western portion of the property, between the main building and the Kittridge bridge structure.

Acme registered as a hazardous waste generator in 1987 and reported quantities of hazardous waste generated in 1993 and 1994. Starting in 1994, Acme registered as a Conditionally Exempt Generator of hazardous waste.

Calbag Metals took over operation of the scrap yard from Acme in 1996.

3.4.2 Previous Environmental Investigations

The only known environmental data for the property east of the Site consists of storm water sampling data and results of hazardous waste designation sampling. Storm water sampling performed between 1989 and 1998 show elevated concentrations of metals including lead, copper, mercury, zinc, chromium, and cadmium in the storm water runoff which drains to City Outfall 19 in the Willamette River. The hazardous waste designation analyses noted that the ash resulting from wire burning had elevated concentrations of metals including chromium, copper, and lead. An EP Tox lead concentration of 61 mg/L was measured in one ash sample.

3.5 North of Kittridge Distribution Center

Tube Forgings, Lone Star, Hampton Industries, Shaver Transportation, and Lakeside Industries are located south of the Site across NW Front Avenue, between NW Front Avenue and the Willamette River. Many of these facilities include use and handling of hazardous substances, including the COIs.

3.5.1 Tube Forgings

3.5.1.1 General Site History

The Tube Forgings property was first developed between 1940 and 1948. The initial building constructed on the property was what is now the western 2/3 of the main building on the property. Roof signage on the original building in the 1948 aerial photograph notes the building as being operated by Oregon Steel Mills. The 1950 and 1969 Sanborn Maps notes the Oregon Steel Mill operations including a Melt Building, Rolling Mill, Paint Storage, Sand Blast area, and Machine Shop. Additions to the building appeared to have occurred between 1948 and 1956 and between

1961 and 1963. Other smaller buildings were also added and some were removed over the years.

Based on the December 10, 1999 DEQ Strategy Recommendation for the Tube Forgings site, Oregon Steel Mills ceased operations on the property in 1976 and Tube Forgings began operations in 1979. A 1989 report prepared by Century West notes that Emery Zidell purchased the property in September 1978.

In 1992 DEQ performed a hazardous waste inspection of the Tube Forgings property. Numerous hazardous waste violations were noted during the inspection including unlabeled drums and tanks with unidentified contents. Subsequent testing of the wastes noted high concentrations of lead, chromium, oil, methylene chloride, toluene, and xylene. Broken waste batteries were observed on the property during the inspection. DEQ subsequently issued an Order to Tube Forgings requiring them to properly designate and manage the waste materials and perform sampling and analysis to assess for releases of hazardous substances. After completion of the required activities, DEQ determined that the requirements of the Order had been met by Tube Forgings.

3.5.1.2 Previous Environmental Investigations

Two sets of environmental investigations have been performed on the Tube Forgings property.

Underground Storage Tank Removal

Two underground storage tanks were removed from the Tube Forgings property in November 1988. The tanks were located on the western edge of the property and both had capacities of 20,000 gallons. The tanks were believed to have previously contained Bunker C oil. Soil samples collected from the bottom of the tank excavations noted oil and grease concentrations of about 50,000 mg/kg. Visibly contaminated soil was reportedly removed from the excavation and disposed off-site during the tank removal work.

In January 1989, Century West collected soil and groundwater samples from four soil borings drilled north, east, and south of the former tank excavation. Oil and grease concentrations of up to 25,000 mg/kg were noted in the soil samples. A groundwater sample was collected from the boring immediately north of the former excavation. 1,2-dichloroethene was detected in the groundwater sample at a concentration of 0.4 µg/L.

Although an April 20, 1989 report by Century West recommended several follow-up actions, it does not appear that any additional activities were performed in response to the petroleum hydrocarbons in the soil.

1992 DEQ Order Investigation

Most of the investigations on the Tube Forgings property have been performed in response to demands by DEQ resulting from a 1991 hazardous waste inspection of the Tube Forgings operations. Tube Forgings was issued a Notice of Non-Compliance as a result of the

inspection. In April 1992, DEQ issued an Order to Tube Forgings requiring them to conduct further investigations of the property. In particular, Tube Forgings was required to sample "...near-surface and sub-surface soils where drums, tanks, and broken batteries were located, and in all additional areas where surface contamination was visibly present during the Department's 1991 inspections..." The Order also noted a waste oil area and a steam cleaning area where investigations were required. Sampling and analysis in an Oil/Water Separator and Storm Drain area were also performed in response to the Order.

Based on information provided in the December 1999 DEQ strategy recommendation for the Tube Forgings property, the results of the investigations noted elevated concentrations of petroleum hydrocarbons, metals, PCBs, volatile organic compounds, and semi-volatile organic compounds in the soil and waste materials on the Tube Forgings property.

Tube Forgings subsequently removed soil from 11 areas on the property and collected confirmation soil samples after the excavations were completed. All of the confirmation soil samples noted petroleum hydrocarbon concentrations less than the site cleanup goal of 500 mg/kg. Analysis for other hazardous substances, including metals, was apparently not performed.

A soil sample collected from beneath the storm water oil/water separator discharge line did not note elevated concentrations of metals. However, samples of the sludge from within the separator noted a lead concentration of 851 mg/kg. DEQ concluded that the storm water discharge line provides a direct pathway from the Tube Forgings property to the Willamette River.

3.5.2 Lone Star

Most of the currently existing Lone Star property consisted of riverfront lowlands or inundated land until about 1970 when Willamette River dredge sand was placed on the property.

From 1970 until the late 1980s or early 1990s, the Lone Star property consisted of vacant ground with varying degrees of disturbance from excavation and fill activities. During this period, an apparent surface water feature was present on the property. The 1991 aerial photograph notes the presence of several aggregate storage piles and an apparent concrete batch plant. Similar site conditions are noted currently on the property.

There have not been any reported environmental investigations on the Lone Star property.

3.5.3 Hampton Industries

The 1940 aerial photograph shows the Hampton property as vacant with little vegetation. The northern portion of the property did not exist until dredge material was placed on the property between 1963 and 1972. The

1950 and 1969 Sanborn Maps note that the southern portion of the property was used for construction equipment storage.

Based on the 1948 through 1972 aerial photographs, the property was used to store east/west trending rows of raw materials with several parallel rail spurs servicing the Tube Forgings property to the west. The raw material appears to be associated with the former Oregon Steel Mill operations on the Tube Forgings property west of the Hampton property.

Sometime between 1972 and 1977, the rail spurs and material piles were removed and the property was generally vacant until sometime between 1986 and 1991. The 1991 aerial photograph shows the site paved with apparent storage of lumber products. Other than the addition of a building between 1991 and 1995, the current use of the property appears to be the same as in the 1991 photograph (i.e. storage of lumber products).

Lone Star registered as a small quantity hazardous waste generator in 1991 (waste naphtha from a parts washer). Starting in 1994, Lone Star indicated that they no longer generate hazardous waste.

There have not been any reported environmental investigations on the Lone Star property.

3.5.4 Shaver Transportation

3.5.4.1 General Site History

The Shaver Transportation property was first developed sometime between 1940 and 1948. The 1940 aerial photograph shows the property as undeveloped and vacant. The 1948 aerial photograph shows the property being used for storage of raw materials in piles. The 1950 Sanborn Map notes that the property was used for storage of construction equipment. Numerous logs rafts are also present on the Willamette River along the Shaver property during this time period.

Based on the aerial photographs, the first dock was constructed off of the Shaver property sometime between 1948 and 1956. A second dock was added by 1957. Shaver started using an area upstream of the initial two docks between 1991 and 1996.

Buildings were first constructed on the property about the same time as the initial construction of the docks. The current building configuration has been present since the early 1960s.

The 1950 Sanborn Map notes a "gasoline tank in ground" on the Shaver property.

3.5.4.2 Previous Environmental Investigations

Two 10,000-gallon diesel tanks were removed from the Shaver property in 1992. Soil samples collected from the tank excavations noted petroleum hydrocarbon concentrations of up to 8,000 mg/kg. Less than 100 cubic yards of contaminated soil was reportedly removed. However,

there is no documentation of any confirmation soil samples being collected. No final report for the underground storage tank remediation was provided to DEQ.

Shaver collected sediment samples from near their docks in 1998 as part of a dredge permit application. The sediment samples were collected from immediately off the Shaver dock, where Shaver activities would have the greatest potential to impact sediments. Elevated concentrations of the Willamette River COIs, including cadmium, lead, mercury, silver, and zinc, were measured in the Shaver sediment samples. The concentrations of these metals were greater than those measured in the sediment samples collected by DEQ and EPA near the City Outfall 19, 200 to 500 feet northwest (i.e. downstream) of the area around the Shaver docks.

3.5.5 Lakeside Industries

3.5.5.1 General Site History

The Lakeside Industries property was undeveloped and vacant until some time between 1940 and 1948. Sometime during this time period, Gunderson Corporation started using the property for storage of raw materials and finished product. Based on the 1950 and 1969 Sanborn Maps, the Gunderson operations included boat works, a plate shop, electrical shop, and pipe shop. Many of these operations would include management raw materials and generation of wastes containing the Willamette River sediment COIs.

Between 1986 and 1991, the property was started to be used as a asphalt mix plant. The aerial photographs during this period note aggregate storage and structures consistent with an asphalt plant. Little change is noted between the 1991 aerial photograph and the current site conditions.

3.5.5.2 Previous Environmental Investigations

Three groundwater monitoring wells have been installed on the Lakeside Industries property as part of the investigation of the current Gunderson property east of the Lakeside Industries property. Low concentrations of volatile organic compounds were detected in groundwater samples from the shallow wells. The detected contamination is consistent with the contaminants present on the Gunderson property. Apparently, no other environmental investigations have been performed on the property.

SECTION 4

ASSESSMENT OF POTENTIAL SOURCES AND PORTLAND HARBOR PATHWAYS OF EXPOSURE

This section presents the assessment of potential contaminant sources on the Kittridge Distribution Center site, the potential contaminant migration pathways from the Site sources to the Willamette River, and the potential receptors associated with the Willamette River.

The potential contaminant sources were assessed based on the recent site conditions and operations. The following potential sources and migration pathways were identified and assessed:

- Former lime pond
- Former acetylene plant and scrap metal facilities and operations

For the purposes of this PA, only those on-site sources and migration pathways possibly occurring during SIC ownership of the site and as a result of operations performed by SIC are considered. In particular, only operations and possible releases occurring after 1996 were considered in this PA.

Only those potential sources and migration pathways associated with contaminants identified by DEQ as COIs in the Willamette River sediments are included in the assessment.

4.1 Possible Willamette River Receptors

The potential exposure receptors associated with the Willamette River are presented in the DEQ Site Strategy Recommendation. These receptors include:

- Persons participating in recreational boating, swimming, and beach use.
- Persons participating in recreational and subsistence fishing.
- Habitat for fish including Chinook salmon and steelhead, which are listed as threatened species under the Federal Endangered Species Act.
- Benthic community in the river sediments.
- Habitat for birds and wildlife.

The potential contaminant sources and migration pathways discussed in this section are those that could possibly impact the above potential

Willamette River receptors as presented by DEQ in their site strategy recommendation.

4.2 Former Lime Pond

Calcium hydroxide, or lime, was produced during the acetylene generation process starting in 1942 through 1985. Because the acetylene generation process consisted of mixing calcium carbide with water, the lime was produced as a lime-water slurry. The lime slurry was placed in a lagoon measuring about 220 feet by 150 feet by 4 feet deep located in the central/western portion of the Site. Figure 4-1 shows the location of the pond in 1986. The location shown in the figure is representative of the *location of the pond throughout its existence between 1942 and 1985.*

Past sampling and analysis of the lime material in the pond has noted elevated concentrations of metals. In particular, lead concentrations of up to 400 mg/kg, chromium concentrations up to 37 mg/kg, and zinc concentrations up to 3100 mg/kg were measured in samples of the lime material. Given the nature of the raw materials and the process generating the lime, it is not known what the source of the metals in the lime would be other than a possible constituent in the calcium carbide raw material. The previous sampling and analysis noted highly alkaline conditions (i.e. high pH) of the pond material, consistent with its high concentration of lime.

DEQ's strategy recommendation suggests that these slightly elevated concentrations could result in migration of the metals to the Willamette River and the Willamette River sediments.

4.2.1 Possible Groundwater Migration Pathway

Theoretically, the presence of elevated metals concentrations in the lime pond could possibly result in elevated concentrations of metals in the groundwater beneath the Site. Given the inferred groundwater flow direction toward the Willamette River, groundwater with elevated metal concentrations could, theoretically, be migrating to the Willamette River.

However, based on the magnitude of metal concentrations in the lime pond soil and the general site conditions, it is highly unlikely that groundwater with elevated metal concentrations is migrating from the Site to the Willamette River. Metals are only slightly soluble in groundwater under near neutral pH conditions that were measured in the site groundwater. Given this relative insolubility of metals in the shallow groundwater at the Site, it is highly doubtful that the modest metal concentrations in the pond soil would result in sufficiently high metal concentrations in the shallow groundwater necessary to impact the sediment in the Willamette River over 1000 feet north of the Site.

The lack of elevated metal concentrations in the shallow groundwater is evidenced by the results of the extensive groundwater sampling and analysis performed on the Site. As noted in Section 3.1.3, two

groundwater investigations have been performed on the Site. Figure 4-1 presents a summary of the results of the assessments and shows the groundwater sampling locations relative to the former pond location.

All of the groundwater samples (both the 1990 and 1996 samples) were collected from temporary well points and none of the temporary wells used sand packs. As a result, all of the groundwater samples had varying amounts of suspended material in the sample. In particular, the samples collected in 1990 from the MWV-series borings were all reported to be turbid and contain significant quantities of suspended soil particulates. Measured metal concentrations in these samples represented the metals in the suspended sediment rather than dissolved metals. The samples collected for metal analyses in 1996 were field-filtered to remove suspended particulates prior to analyses.

As shown on Figure 4-1 and notwithstanding the reported turbidity of the samples, metals were not detected in the shallow groundwater at 10 of the 16 groundwater sampling locations. Low concentrations of zinc were the only metal detected at 3 of the 6 locations where metals were detected. A low concentration of lead (0.004 mg/L) was the only metal detected in 1 of the 6 locations where metals were detected. The two samples where any significant concentrations of metals were detected were in two of the turbid MWV-series samples. One of these samples was located down gradient from the former pond and the other sample was collected cross-gradient from the former pond. The sample collected cross-gradient from the pond had the greatest turbidity and had the greatest metal concentrations of any of the samples. Based on the observed relationship between the sample turbidity and the measured metal concentrations and the lack of any relationship between the sample location and the former pond location, the few detected metal concentrations in the groundwater simply reflect the presence of the suspended particulates and are independent of the presence of the former pond.

Based on the results of the groundwater sampling and analysis, groundwater beneath the Site has not been adversely impacted by any migration of metals from the former pond soil. Given the lack of impacts to the shallow groundwater at the Site and the over 1000-foot distance from the Site to the Willamette River, shallow groundwater migration to the Willamette River has not caused an impact to the Willamette River sediments.

4.2.2 Possible Surface Water Migration Pathway

The entire area of the former Lime Pond is either paved or covered with buildings. There are no areas of the former Lime Pond area with exposed ground surface. There is no exposed soil with elevated concentrations of hazardous substances, including the COIs, in the former Lime Pond area.

Storm water runoff from the paved area of the former Lime Pond is captured by catch basins. Each catch basin has a sediment trap that minimizes any suspended sediment being conveyed with the storm water into the City of Portland storm water system.

Based on the above, COIs are not migrating from former Lime Pond area on the Site to the Willamette River through the surface water runoff.

4.2.3 Possible Air Migration Pathway

The entire area of the former Lime Pond is either paved or covered with buildings. There are no areas of the former Lime Pond area with exposed ground surface. There is no surface water contact with soil with elevated concentrations of hazardous substances, including the COIs, in the former Lime Pond area.

Therefore, there is no potential for soil with COIs to become airborne and migrate to the Willamette River. The non-volatile nature of the COIs and the presence of pavement and buildings prevents any volatilization of the COIs from the former Lime Pond area and the subsequent migration through the air to the Willamette River.

4.2.4 Summary of Former Lime Pond as Possible Source

Based on the above, COIs are not migrating to the Willamette River from the former Lime Pond area. No further assessment of the Lime Pond as a possible source of COIs to the Willamette River is necessary.

4.3 Former Acetylene Plant and Scrap Metal Facilities and Operations

As noted in Section 3.1.2, the Site was used as an acetylene generation plant and a scrap metal storage yard prior to SIC's ownership of the Site. Several features and activities associated with these features had some potential for releases of hazardous substances. These features and activities include:

- Underground storage tanks
- Dry well
- Septic tank systems
- Outside scrap metal storage

Hazardous substances could possibly have been released from these features and, theoretically, could be an on-going source of COIs to the Willamette River. This section assesses the potential for such releases and migration to be currently occurring.

4.3.1 Possible Groundwater Migration Pathway

As discussed in Section 4.2.1, dissolved metals have not adversely impacted the shallow groundwater beneath the Site. The lack of COIs in the groundwater demonstrates that there are no sources on the Site causing COI contamination of the shallow groundwater. Therefore, there

is no COI-contaminated groundwater migrating from the Site to the Willamette River.

4.3.2 Possible Surface Water Migration Pathway

All of the features associated with the former acetylene plant and scrap metal yard have been removed from the Site. Over 90 percent of the Site is either paved or covered with buildings. The small portion of the Site that is not paved is covered with clean landscape fill that has been imported to the site. There are no areas of exposed ground surface associated with the previous use of the Site.

Storm water run off from the existing parking lot and roof drains is conveyed to the City of Portland storm water system. Storm water runoff does not contact any bare ground or features associated with the previous use of the Site. Therefore, there is no potential for COIs, that may have been released during the previous use of the Site (prior to SIC ownership), to migrate offsite through surface water flow. No COIs are migrating to the Willamette River from the Site through surface water runoff.

4.3.3 Possible Air Migration Pathway

Over 90 percent of the Site is either paved or covered with buildings. The small portion of the Site that is not paved is covered with clean landscape fill that has been imported to the site. There are no areas of exposed ground surface associated with the previous use of the Site. Therefore, there is no potential for soil with COIs to become airborne and migrate to the Willamette River. The non-volatile nature and the presence of pavement, buildings, and clean fill cover prevents any volatilization of the COIs and the subsequent migration through the air to the Willamette River.

4.3.4 Summary of Former Acetylene Plant and Scrap Metal Facilities and Operations as Possible Source

Based on the above, COIs are not migrating to the Willamette River from the Site as a result of possible releases occurring during the previous use of the site as an acetylene plant or a scrap metal yard (all occurring prior to SIC's ownership of the property). No further assessment of the Site as a possible source of COIs to the Willamette River is necessary.

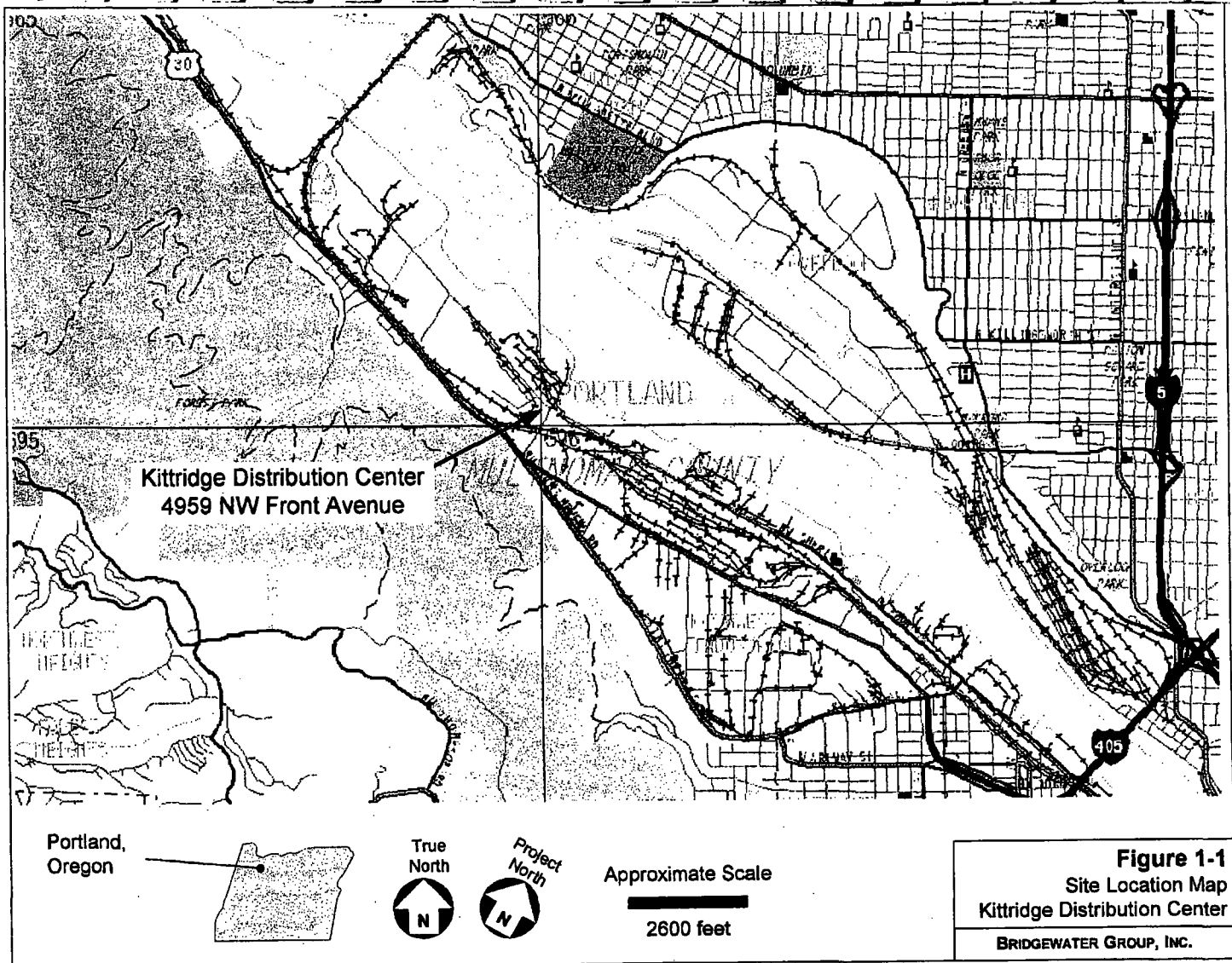
Table 3-1
Detected Chemicals in Groundwater Samples
4959 NW Front Avenue

Sampling					Concentration (mg/L)								
Location	Date	Acetone	MIBK	Filtered	Total Arsenic	Total Beryllium	Total Cadmium	Total Chromium	Total Copper	Total Lead	Total Mercury	Total Nickel	Total Zinc
MW-1	Jul-90	0.05 U	0.05 U	No	0.29	0.02 U	0.02 U	0.36	0.8	0.1 U	0.002 U	0.36	1.2
MW-2	Jul-90	17	4.6	No	0.005	0.02 U	0.02 U	0.1	0.2	0.1 U	0.002 U	0.1 U	0.28
MW-3	Jul-90	0.05 U	0.05 U	No	0.35	0.03	0.06	0.76	1.7	0.29	0.003	0.94	2.2
MW-4	Jul-90	0.05 U	0.05 U	No	0.28	0.04	0.06	0.96	1.8	0.34	0.084	1.2	3
MW-5	Jul-90	0.05 U	0.05 U	No	0.077	0.02 U	0.02 U	0.21	0.49	0.1 U	0.002 U	0.23	0.6
Location	Date	Acetone	MIBK	Filtered ¹	Dissolved Arsenic	Dissolved Beryllium	Dissolved Cadmium	Dissolved Chromium	Dissolved Copper	Dissolved Lead	Dissolved Mercury	Dissolved Nickel	Dissolved Zinc
WP-1	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.005	NA
WP-2	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.005 U	NA
WP-3	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.0073	NA
WP-4	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.011	NA
WP-5	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.011	NA
WP-6	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.004	0.0002 U	0.014	NA
WP-7	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.0067	NA
WP-8	Dec-95	0.025 U	5 U	Yes	0.002 U	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.0055	NA
WP-9	Dec-95	0.025 U	5 U	Yes	0.011	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.0055	NA
WP-10	Dec-95	0.025 U	5 U	Yes	0.014	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.005 U	NA
WP-11	Dec-95	0.025 U	5 U	Yes	0.011	NA	0.005 U	0.005 U	NA	0.002 U	0.0002 U	0.005 U	NA

NA - Not analyzed

U - Not detected at noted reporting limit

1 - Only samples analyzed for metals were filtered.



CRAW00013250

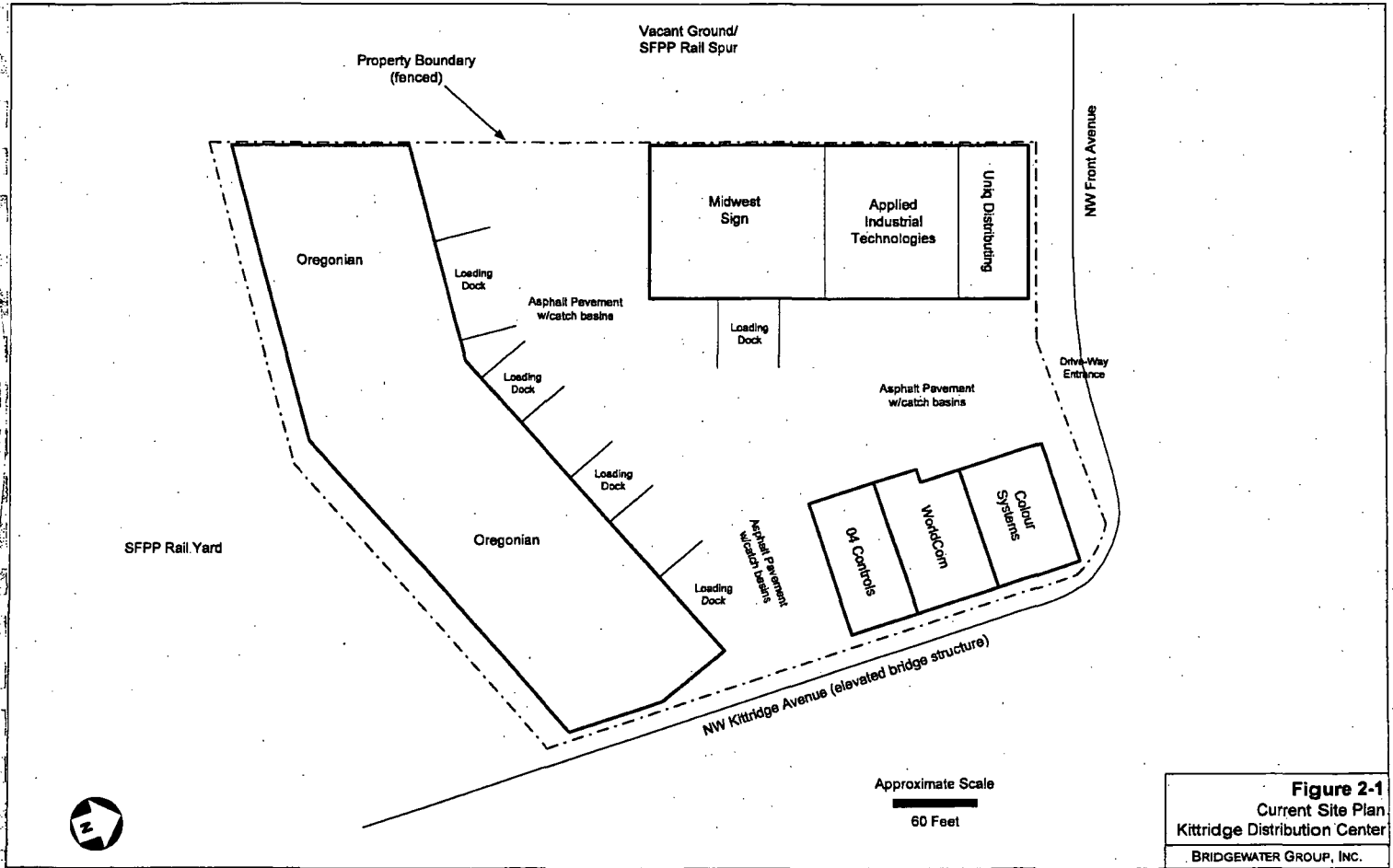
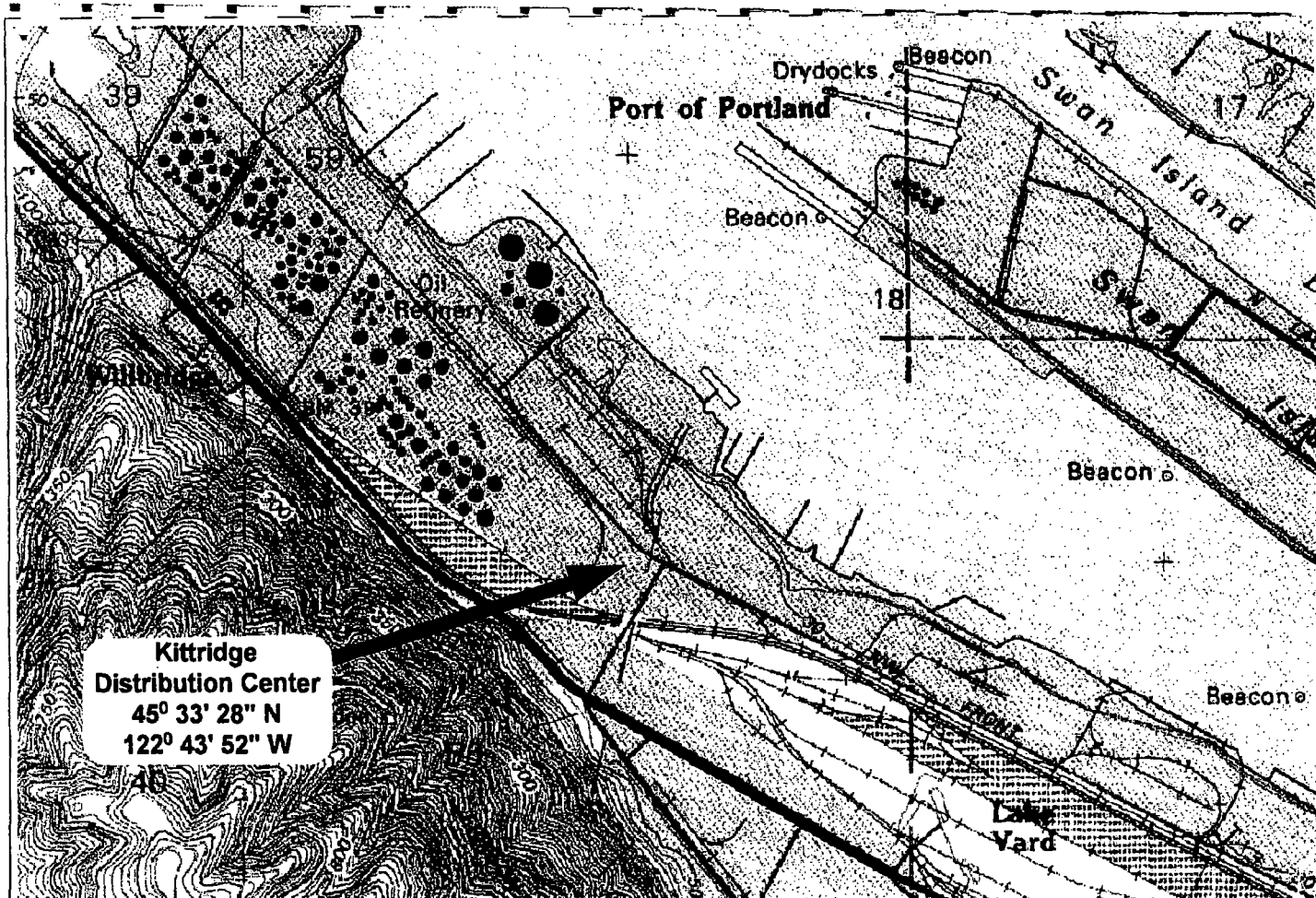


Figure 2-1
Current Site Plan
Kittridge Distribution Center
 BRIDGEWATER GROUP, INC.



**Kittridge
Distribution Center**
45° 33' 28" N
122° 43' 52" W

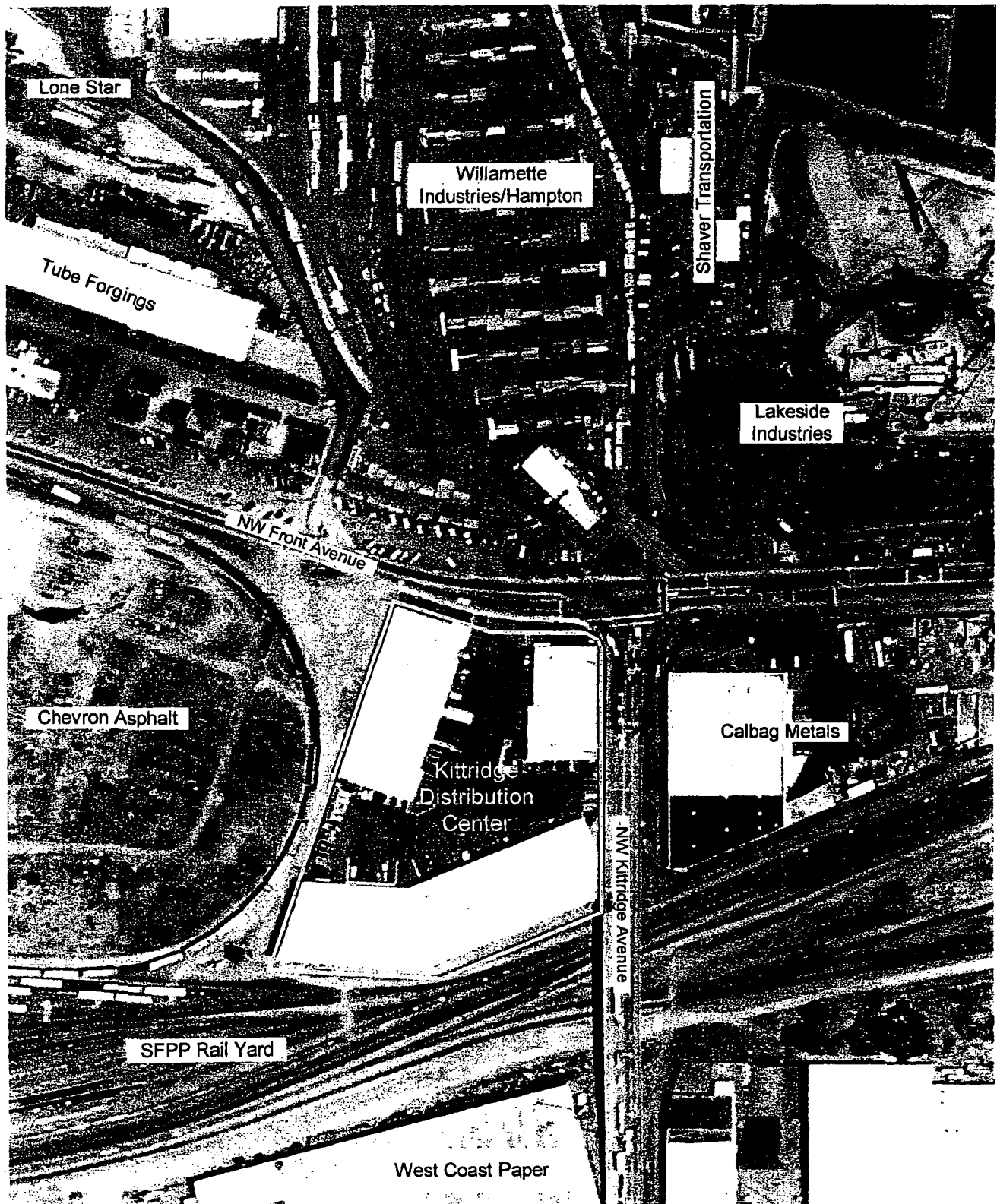
Figure from USGS
Topographic Map Portland
Quadrangle
Photorevised 1990



Approximate Scale
1,010 feet

Figure 2-2
USGS Topographic Map
Kittridge Distribution Center
BRIDGEWATER GROUP, INC.

CRAW00013252



(Project North)

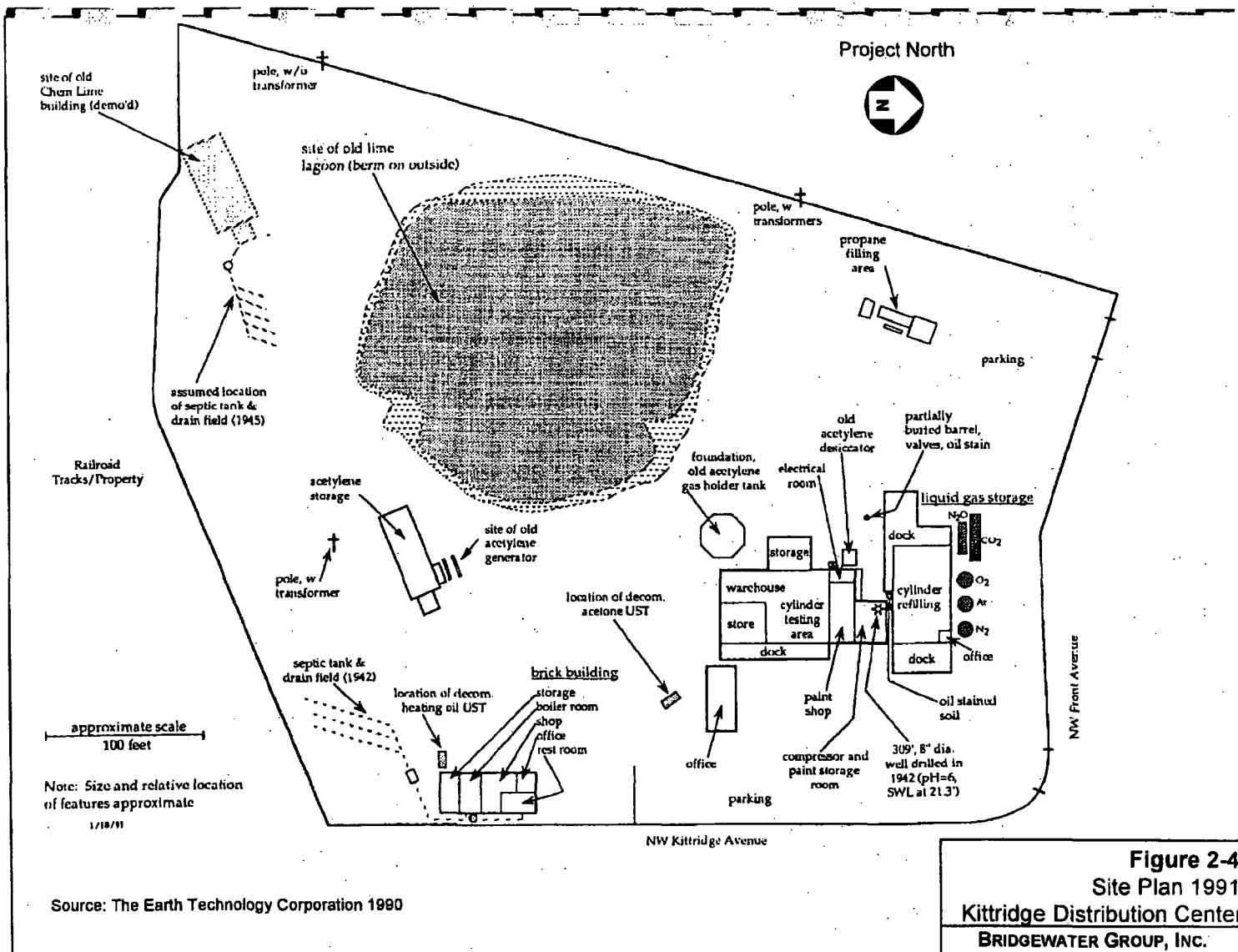


Approximate Scale

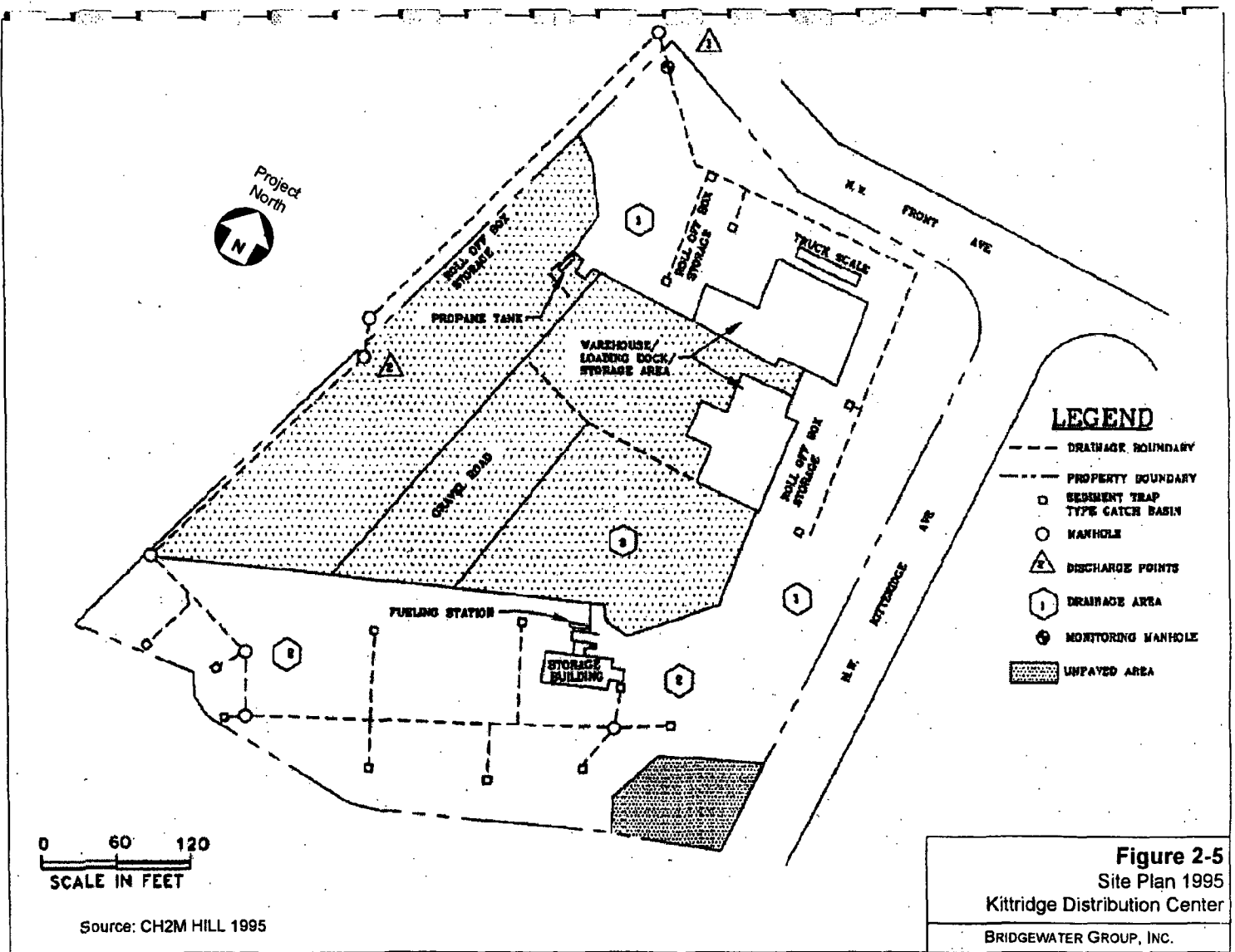
200 Feet

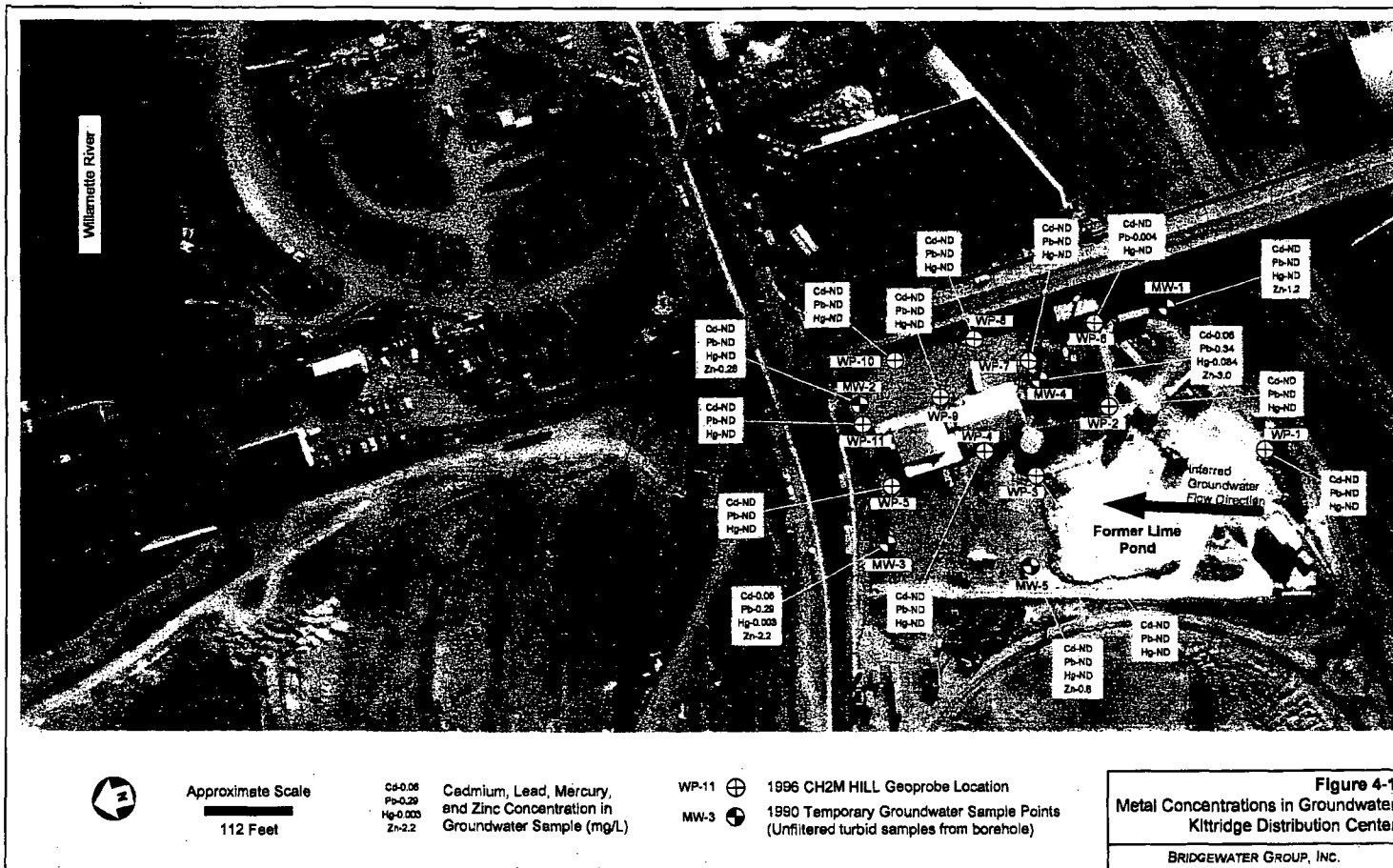
Figure 2-3
1998 Aerial Photograph
Kittridge Distribution Center

BRIDGEWATER GROUP, INC.



CRAW00013254





APPENDIX A

**PHOTOGRAPHS OF CURRENT SITE
CONDITIONS**

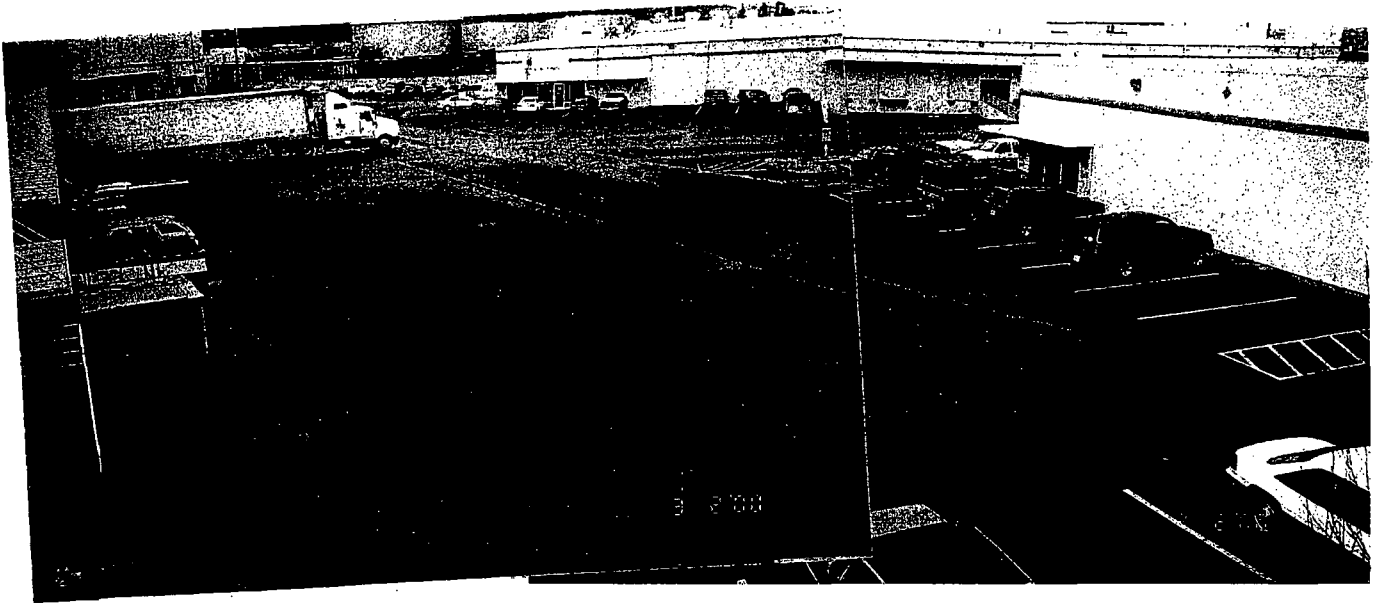


Photo No. 1

Photo Date: 3/2/00

Looking west from east edge of Kittridge Distribution Center.

CRAW00013258

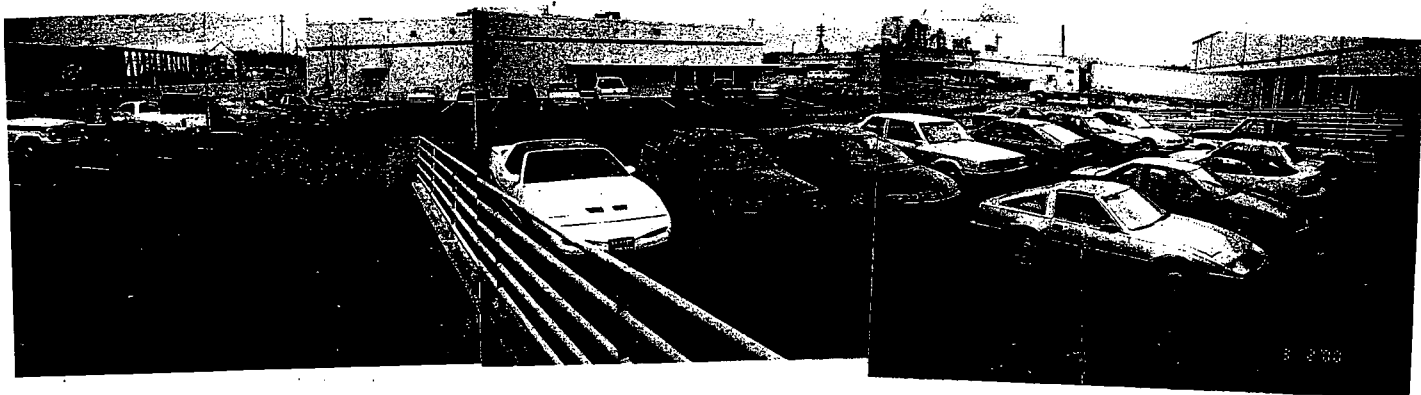


Photo No. 2

Photo Date: 3/2/00

Looking northeast from southwest corner of Kittridge Distribution Center.

CRAW00013259

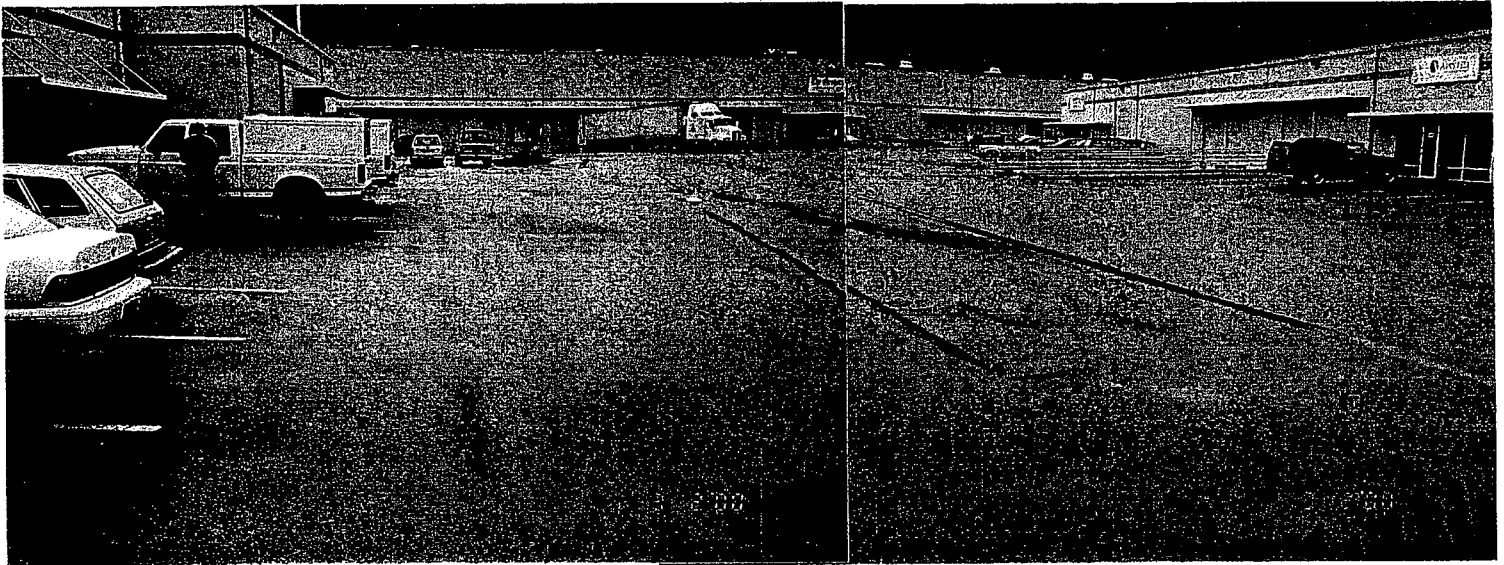


Photo No. 3

Photo Date: 3/2/00

Looking south from north entrance of Kittridge Distribution Center.

CRAW00013260



Photo No. 4

Looking north along western edge of Kittridge Distribution Center.

Photo Date: 3/2/00

CRAW00013261



Photo No. 5

Photo Date: 3/2/00

Looking north down east property line.



Photo No: 6

Photo Date: 3/2/00

Looking west down south property line.



Photo No. 7

Photo Date: 3/2/00

Looking northeast from north entrance of Kittridge Distribution Center.



Photo No: 8

Photo Date: 3/2/00

Looking northwest from north entrance of Kittridge Distribution Center.



Photo No. 9

Photo Date: 3/2/00

Interior of Colour Systems.

CRAW00013264



Photo No. 10

Photo Date: 3/2/00

Interior of WorldCom.

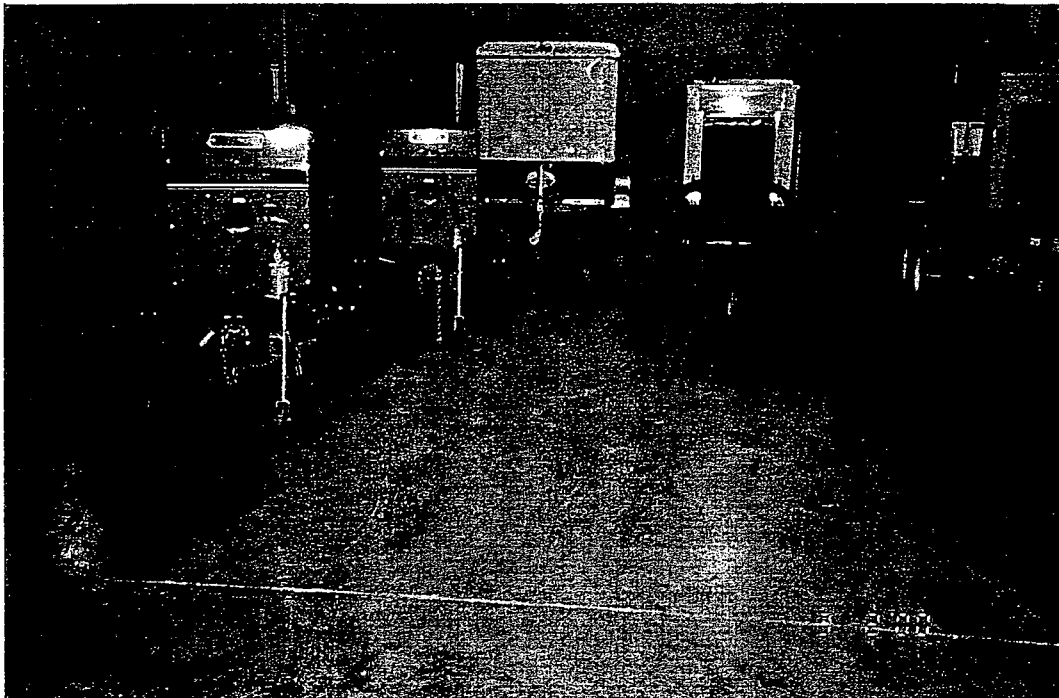


Photo No. 11

Photo Date: 3/2/00

Interior of WorldCom.



Photo No. 12

Photo Date: 3/2/00

Interior of 04 Controls.

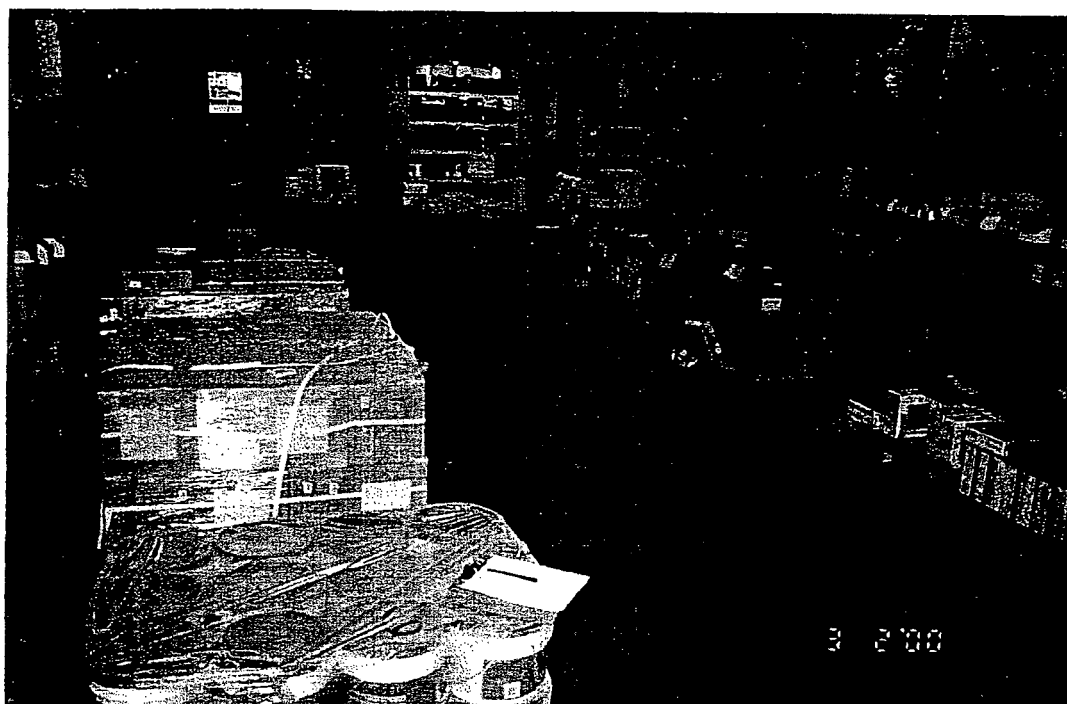


Photo No: 13

Photo Date: 3/2/00

Interior of Uniq Distribution.



Photo No. 14

Photo Date: 3/2/00

Interior of Applied Industrial Technologies

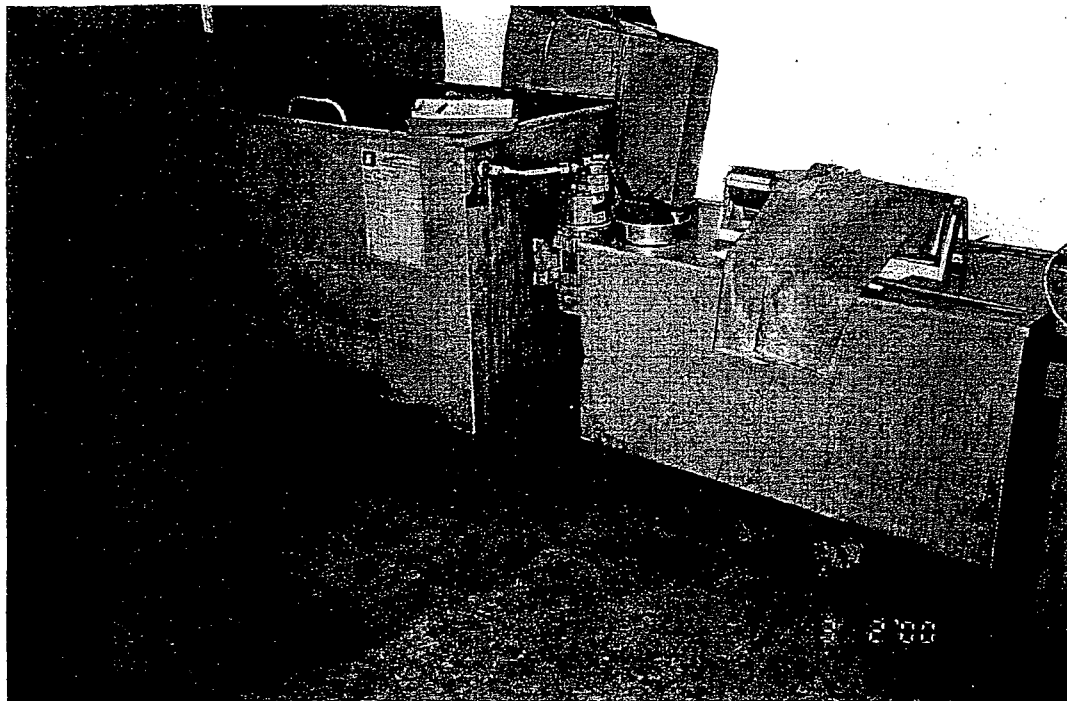


Photo No: 15

Photo Date: 3/2/00

Safety Kleen bearing washers in Applied Industrial Technologies.



Photo No. 16

Photo Date: 3/2/00

Interior of Midwest Signs.

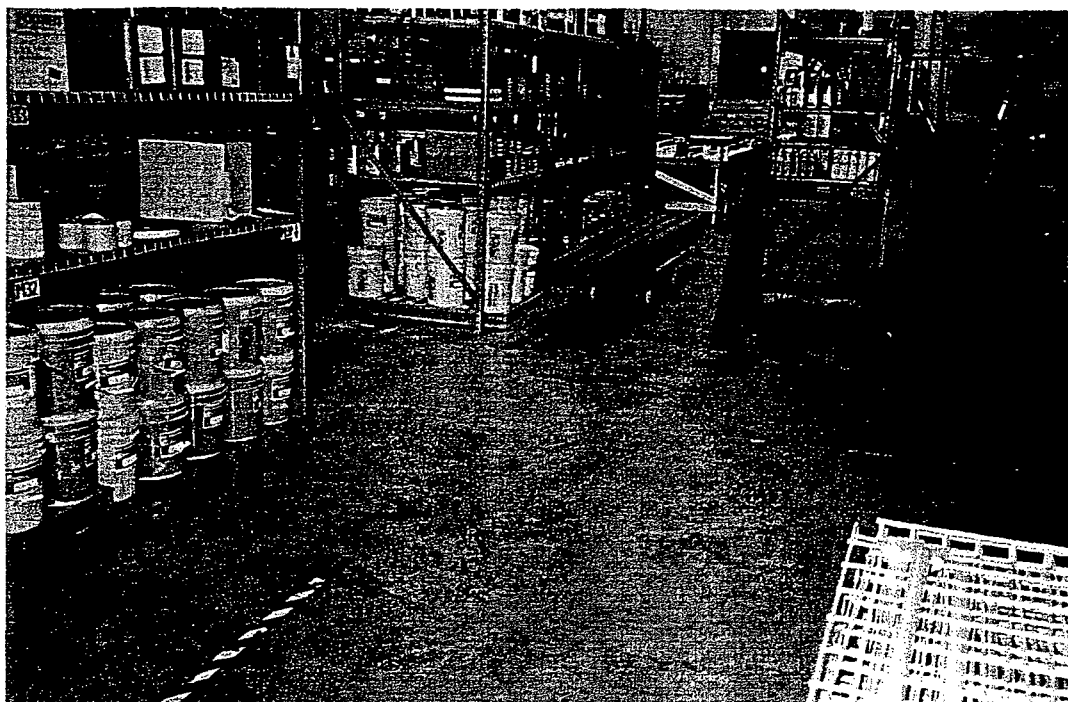


Photo No: 17

Photo Date: 3/2/00

Interior of Midwest Signs.



Photo No. 18

Photo Date: 3/2/00

Interior of Midwest Signs.



Photo No: 19

Photo Date: 3/2/00

Looking west from east of interior of Oregonian space.



Photo No. 20

Photo Date: 3/2/00

Looking west at west end of interior of Oregonian space.



Photo No: 21

Photo Date: 3/2/00

Air compressor water drain to floor drains at northwest corner of interior of Oregonian space.

CASCADE FIRE PROTECTION CO. **REPORT OF INSPECTION**

Name of Facility K. H. dyc Bus. Park Date 7-22-03
 Address 5035-5043 NW FRONT AVE Building/Location A
 City PORTLAND State OR Contact Person Mike
 Telephone _____

Type of Occupancy (circle): Retail/Offices/Assembly/Industrial/Storage/Other

A. OWNER'S SECTION Automatic Fire Sprinkler System - Current History

- Describe any occupancy changes since the last inspection N/A
- Describe fire protection modifications since the last inspection N/A
- Describe any fires since last inspection N/A
- Date sprinkler system was installed (approximate if unknown) 80
- Type of business at that time _____

B. INSPECTOR'S SECTION

1. GENERAL

Annual, Semi-annual, Quarterly

- Are all areas of the building provided with sprinkler protection per NFPA 13? X X
- Record water pressure at riser upon arrival 165
- Is the building occupied? X
- Is there a minimum of 18 in. (457 mm) clearance between the top of the storage and the sprinkler deflector? X
- Does the hand hose on the sprinkler system appear to be satisfactory? X
- Do all exterior openings appear to be protected against freezing? X
- Is system supervised by an alarm company?
Alarm Company name PRO TECH X
- Did alarm company receive signals from this test? X

2. CONTROL VALVES

- Are all sprinkler system control valves and all other valves in the appropriate open or closed position? X
- Are all control valves in the open position and locked, sealed, or supervised? X
- Are all control valves properly indicated or labeled? X

3. TANKS, PUMP, FIRE DEPARTMENT CONNECTIONS

- Are fire pumps, gravity tanks, reservoirs and pressure tanks in good condition and properly maintained? X
- Are fire department connections in satisfactory condition, couplings free, caps in place, check valves tight, and drop valves functional? X

4. WET SYSTEMS size 6 make NIBCO model BFV YES NO N/A NOG A

- A. Are all cold weather valves in the appropriate open or closed position? X — —
- B. Have antifreeze system solutions been tested? List test results — — X
- C. In areas protected by wet systems, does building appear to be properly heated? Including blind attic and perimeter areas where accessible? X — —

5. DRY SYSTEMS size — make — model —

- A. Is the dry valve in service? — — —
- B. Are the air pressure and priming water level in accordance with the manufacturer's instructions? — — —
- C. Has the operation of the air or nitrogen supply been tested? — — —
- D. Were low points drained during this inspection? — — —
- E. Did quick-opening device operate satisfactorily? make — model — — — —
- F. Was dry valve tripped during this inspection? — — —
- G. Is the heating equipment in the dry-pipe valve room operational? — — —

Date valve was wet tripped — Date valve was dry tripped — Date Q.O.D. was tripped —

Time to Trip Thru Test Pipe		Initial Water Pressure	Initial Air Pressure	Trip Point Air Pressure	Time Water Reached Test Outlet	
Minutes	Seconds	PSI	PSI	PSI	Minutes	Seconds

6. ALARMS

- A. Did water motor gong test satisfactorily? — — X
- B. Did electric alarm test satisfactorily? (flow or pressure switch) X — —
(Were alarms disconnected prior to testing YES/NO)
- C. Do tamper switches activate a signal? X — —
- D. Did low air switch activate a signal? — — X

7. SPRINKLERS

- A. Are all sprinklers free from corrosion, loading or obstruction to spray? X — —
- B. Are all sprinkler heads less than 50 years old? X — —
- C. Is stock of spare sprinklers available by the riser? X — —
- D. Is the exterior condition of the sprinkler system satisfactory? X — —
- E. Are sprinklers proper temperature ratings for their locations? — — —

MAIN DRAIN FLOW TEST

Date	Test Pipe Location	Size Test Pipe			Static Pressure	Residual Pressure
9-22-03	RISER	1"	1 1/4"	1 1/2" (2)	170	60

(See back side of this sheet regarding comments on this system)

NO PUMP

TEST RESULTS OF SYSTEM# 2 Hose Reels system4. WET SYSTEMS size 2" make NIBCO model RR YES NO N/AA. Are all cold weather valves in the appropriate open or closed position? X — —B. Have antifreeze system solutions been tested? List test results — — XC. In areas protected by wet systems, does building appear to be properly heated? Including blind attic and perimeter areas where accessible? X — —5. DRY SYSTEMS size — make — model —A. Is the dry valve in service? — — 7B. Are the air pressure and priming water level in accordance with the manufacturer's instructions? — — —C. Has the operation of the air or nitrogen supply been tested? — — —D. Were low points drained during this inspection? — — —E. Did quick-opening devices operate satisfactorily? make — model — —F. Was dry valve tripped during this inspection? (attach data) — — —G. Is the heating equipment in the dry-pipe valve room operational? — — —Date valve was wet tripped — Date valve was dry tripped — Date Q.O.D. was tripped —

Q.O.D. TRIP OK	Time to Trip Thru Test Pipe		Initial Water Pressure	Initial Air Pressure	Trip Point Air Pressure	Time Water Reached Test Outlet	
	Minutes	Seconds	PSI	PSI	PSI	Minutes	Seconds

6. ALARMS

A. Did water motor gong test satisfactorily? — — XB. Did electric alarm test satisfactorily? (flow or pressure switch) X — —C. Do tamper switches activate a signal? — X —

7. SPRINKLERS

A. Are all sprinklers free from corrosion, loading or obstruction to spray? — — XB. Are all sprinkler heads less than 50 years old? — — XC. Is stock of spare sprinklers available by the riser? X — —D. Is the exterior condition of the sprinkler system satisfactory? X — —E. Are sprinklers proper temperature ratings for their locations? — — X

Date	Test Pipe Location	Size Test Pipe	Static Pressure	Residual Pressure
9-22-07	Riser	2"	170	60

(see back side of this sheet regarding comments on this system)

Explain any "No" answers and comments:

2" CONTROL VA BROKEN VALVE WILL NOT CLOSE

Adjustments or corrections made during this inspection:

Although these comments are not the result of an engineering review, the following desirable improvements are recommended:

REPLACE 2" CONTROL VA

CASCADE FIRE PROTECTION CO. REPORT OF INSPECTION

Name of Facility KITTRIDGE BUS PARK Date 9-22-03
 Address 4931-3943 NW Front Ave Building/Location B
 City PORTLAND State OR Contact Person MIKE
 Telephone _____

Type of Occupancy (circle): Retail/Offices/Assembly/Industrial/Storage/Other

OWNER'S SECTION Automatic Fire Sprinkler System - Current History

Describe any occupancy changes since the last inspection _____

Describe fire protection modifications since the last inspection _____

Describe any fires since last inspection _____

Date sprinkler system was installed (approximate if unknown) _____

Type of business at that time _____

INSPECTOR'S SECTION

YES NO N/A

1. GENERAL

Annual Semi-annual Quarterly

A. Are all areas of the building provided with sprinkler protection per NFPA 137 X _____

B. Record water pressure at riser upon arrival 170 X _____

C. Is the building occupied? X _____

D. Is there a minimum of 18 in. (457 mm) clearance between the top of the storage and the sprinkler deflector? X _____

E. Does the hand hose on the sprinkler system appear to be satisfactory? _____ X

F. Do all exterior openings appear to be protected against freezing? X _____

G. Is system supervised by an alarm company? X _____

Alarm Company name Pro Tec

H. Did alarm company receive signals from this test? X _____

2. CONTROL VALVES

A. Are all sprinkler system control valves and all other valves in the appropriate open or closed position? X _____

B. Are all control valves in the open position and locked, sealed, or supervised? X _____

C. Are all control valves properly indicated or labeled? X _____

3. TANKS, PUMP, FIRE DEPARTMENT CONNECTIONS

A. Are fire pumps, gravity tanks, reservoirs and pressure tanks in good condition and properly maintained? X _____

B. Are fire department connections in satisfactory condition, couplings free, caps in place, check valves tight, and drop valves functional? X _____

4. WET SYSTEMS size 2 make NBCU model BFV YES NO N/A BLDG 3

- A. Are all cold weather valves in the appropriate open or closed position? X — —
- B. Have antifreeze system solutions been tested? List test results — — X
- C. In areas protected by wet systems, does building appear to be properly heated? Including blind attic and perimeter areas where accessible? X — —

5. DRY SYSTEMS size — make — model —

- A. Is the dry valve in service? — — —
- B. Are the air pressure and priming water level in accordance with the manufacturer's instructions? — — —
- C. Has the operation of the air or nitrogen supply been tested? — — —
- D. Were low points drained during this inspection? — — —
- E. Did quick-opening device operate satisfactorily? — — —
make — model —
- F. Was dry valve tripped during this inspection? — — —
- G. Is the heating equipment in the dry-pipe valve room operational? — — —

Date valve was wet tripped — Date valve was dry tripped — Date Q.O.D. was tripped —

Time to Trip Thru Test Pipe		Initial Water Pressure	Initial Air Pressure	Trip Point Air Pressure	Time Water Reached Test Outlet	
Minutes	Seconds	PSI	PSI	PSI	Minutes	Seconds

6. ALARMS

- A. Did water motor gong test satisfactorily? — — X
- B. Did electric alarm test satisfactorily? (Flow or pressure switch) X — —
(Were alarms disconnected prior to testing YES/NO)
- C. Do tamper switches activate a signal? X — —
- D. Did low air switch activate a signal? — — X

7. SPRINKLERS

- A. Are all sprinklers free from corrosion, loading or obstruction to spray? X — —
- B. Are all sprinkler heads less than 50 years old? X — —
- C. Is stock of spare sprinklers available by the riser? X — —
- D. Is the exterior condition of the sprinkler system satisfactory? X — —
- E. Are sprinklers proper temperature ratings for their locations? X — —

MAIN DRAIN FLOW TEST

Date	Test Pipe Location	Size Test Pipe			Static Pressure	Residual Pressure
9-22-03	RISER	1"	1 1/4"	1 1/2" 2"	100	60

(See back side of this sheet regarding comments on this system)

no pump

Explain any "No" answers and comments:

OK

Adjustments or corrections made during this inspection:

Although these comments are not the result of an engineering review, the following desirable improvements are recommended:

CASCADE FIRE PROTECTION CO. **REPORT OF INSPECTION**

Name of Facility K. Tr.idge Business Park Date 9-22-03
 Address 5015 NW 8th Ave Building/Location C
 City Portland State OR Contact Person Mike
 Telephone _____

Type of Occupancy (circle): Retail/Offices/Assembly/Industrial/Storage/Other _____

A. OWNER'S SECTION Automatic Fire Sprinkler System - Current History

1. Describe any occupancy changes since the last inspection N/A
2. Describe fire protection modifications since the last inspection N/A
3. Describe any fires since last inspection N/A
4. Date sprinkler system was installed (approximate if unknown) 95
5. Type of business at that time _____

B. INSPECTOR'S SECTION

YES NO N/A

1. GENERAL Annual, Semi-annual, Quarterly

- | | | | |
|--|----------|---|---|
| A. Are all areas of the building provided with sprinkler protection per NFPA 13? | <u>X</u> | — | — |
| B. Record water pressure at riser upon arrival <u>185</u> | <u>X</u> | — | — |
| C. Is the building occupied? | <u>X</u> | — | — |
| D. Is there a minimum of 18 in. (457 mm) clearance between the top of the storage and the sprinkler deflector? | <u>X</u> | — | — |
| E. Does the hand hose on the sprinkler system appear to be satisfactory? | <u>X</u> | — | — |
| F. Do all exterior openings appear to be protected against freezing? | <u>X</u> | — | — |
| G. Is system supervised by an alarm company?
Alarm Company name <u>Protect</u> | <u>X</u> | — | — |
| H. Did alarm company receive signals from this test? | <u>X</u> | — | — |

2. CONTROL VALVES

- | | | | |
|---|----------|---|---|
| A. Are all sprinkler system control valves and all other valves in the appropriate open or closed position? | <u>X</u> | — | — |
| B. Are all control valves in the open position and locked, sealed, or supervised? | <u>X</u> | — | — |
| C. Are all control valves properly indicated or labeled? | <u>X</u> | — | — |

3. TANKS, PUMP, FIRE DEPARTMENT CONNECTIONS

- | | | | |
|--|----------|---|---|
| A. Are fire pumps, gravity tanks, reservoirs and pressure tanks in good condition and properly maintained? | <u>X</u> | — | — |
| B. Are fire department connections in satisfactory condition, couplings free, caps in place, check valves tight, and drop valves functional? | <u>X</u> | — | — |

TEST RESULTS OF SYSTEM

4. WET SYSTEMS size 6 make NBCU model BRU YES NO N/A BLDG C

A. Are all cold weather valves in the appropriate open or closed position? A NO N/A

B. Have antifreeze system solutions been tested? List test results NO NO N/A

C. In areas protected by wet system, does building appear to be properly heated? Including blind attic and perimeter areas where accessible? A NO N/A

5. DRY SYSTEMS size make model

A. Is the dry valve in service? NO N/A

B. Are the air pressure and priming water level in accordance with the manufacturer's instructions? NO N/A

C. Has the operation of the air or nitrogen supply been tested? NO N/A

D. Were low points drained during this inspection? NO N/A

E. Did quick-opening device operate satisfactorily? NO N/A
make model

F. Was dry valve tripped during this inspection? NO N/A

G. Is the heating equipment in the dry-pipe valve room operational? NO N/A

Date valve was wet tripped Date valve was dry tripped Date Q.O.D. was tripped

Time to Trip Thru Test Pipe		Initial Water Pressure	Initial Air Pressure	Trip Point Air Pressure	Time Water Reached Test Outlet	
Minutes	Seconds	PSI	PSI	PSI	Minutes	Seconds

6. ALARMS

A. Did water motor gong test satisfactorily? NO N/A

B. Did electric alarm test satisfactorily? (flow or pressure switch) NO N/A
(Were alarm disconnected prior to testing YES/NO)

C. Do tamper switches activate a signal? NO N/A

D. Did low air switch activate a signal? NO N/A

7. SPRINKLERS

A. Are all sprinklers free from corrosion, loading or obstruction to spray? NO N/A

B. Are all sprinkler heads less than 50 years old? NO N/A

C. Is stock of spare sprinklers available by the riser? NO N/A

D. Is the exterior condition of the sprinkler system satisfactory? NO N/A

E. Are sprinklers proper temperature ratings for their locations? NO N/A

MAIN DRAIN FLOW TEST

Date	Test Pipe Location	Size Test Pipe	Static Pressure	Residual Pressure
9-22-03	RISER	1" 1 1/4" 1 1/2" (3)	172	70

(See back side of this sheet regarding comments on this system)

NO Pump

185

4.14 PUMP

1. Explain any "No" answers and comments:

OK

2. Adjustments or corrections made during this inspection:

3. Although these comments are not the result of an engineering review, the following desirable improvements are recommended:

TEST RESULTS OF DISINTEGRATION

4. WET SYSTEMS size 6 make NIBCO model 620 YES NO N/A BLDG C

A. Are all cold weather valves in the appropriate open or closed position? X NO N/A

B. Have antifreeze system solutions been tested? List test results NO NO X

C. In areas protected by wet systems, does building appear to be properly heated? Including blind attic and perimeter areas where accessible? X NO N/A

5. DRY SYSTEMS size make model

A. Is the dry valve in service? NO N/A

B. Are the air pressure and priming water level in accordance with the manufacturer's instructions? NO N/A

C. Has the operation of the air or nitrogen supply been tested? NO N/A

D. Were low points drained during this inspection? NO N/A

E. Did quick-opening device operate satisfactorily? NO N/A

F. Was dry valve tripped during this inspection? NO N/A

G. Is the heating equipment in the dry-pipe valve room operational? NO N/A

Date valve was wet tripped Date valve was dry tripped Date Q.O.D. was tripped

Time to Trip Thru Test Pipe		Initial Water Pressure	Initial Air Pressure	Trip Point Air Pressure	Time Water Reached Test Outlet	
Minutes	Seconds	PSI	PSI	PSI	Minutes	Seconds

6. ALARMS

A. Did water motor gong test satisfactorily? NO X

B. Did electric alarm test satisfactorily? (flow or pressure switch) X NO N/A

(Were alarms disconnected prior to testing YES (NO) NO)

C. Do tamper switches activate a signal? X NO N/A

D. Did low air switch activate a signal? NO X

7. SPRINKLERS

A. Are all sprinklers free from corrosion, loading or obstruction to spray? X NO N/A

B. Are all sprinkler heads less than 50 years old? X NO N/A

C. Is stock of spare sprinklers available by the riser? X NO N/A

D. Is the exterior condition of the sprinkler system satisfactory? X NO N/A

E. Are sprinklers proper temperature ratings for their locations? X NO N/A

MAIN DRAIN FLOW TEST

Date	Test Pipe Location	Size Test Pipe	Static Pressure	Residual Pressure
9-22-03	RISER	1" 1 1/4" 1 1/2" (2)	175	70

(See back side of this sheet regarding comments on this system)

NO pump
184
with pump

Explain any "No" answers and comments:

OK

Adjustments or corrections made during this inspection:

Although these comments are not the result of an engineering review, the following desirable improvements are recommended:

TEST RESULTS OF SYSTEM# 3 Hose Rack4. WET SYSTEMS size 2 make NISCO model BA YES NO N/AA. Are all cold weather valves in the appropriate open or closed position? X — —B. Have antifreeze system solutions been tested? List test results — — XC. In areas protected by wet systems, does building appear to be properly heated? Including blind attic and perimeter areas where accessible? X — —5. DRY SYSTEMS size — make — model —A. Is the dry valve in service? — — —B. Are the air pressure and priming water level in accordance with the manufacturer's instructions? — — —C. Has the operation of the air or nitrogen supply been tested? — — —D. Were low points drained during this inspection? — — —E. Did quick-opening devices operate satisfactorily? make — model — — — —F. Was dry valve tripped during this inspection? (attach data) — — —G. Is the heating equipment in the dry-pipe valve room operational? — — —Date valve was wet tripped — Date valve was dry tripped — Date Q.O.D. was tripped —

Q.O.D. TRIP OK	Time to Trip		Initial Water Pressure PSI	Initial Air Pressure PSI	Trip Point Air Pressure PSI	Time Water Reached Test Outlet		
	Thru Test Pipe							
	Minutes	Seconds				Minutes	Seconds	

6. ALARMSA. Did water motor gong test satisfactorily? — — XB. Did electric alarm test satisfactorily? (flow or pressure switch) X — —C. Do tamper switches activate a signal? X — X**7. SPRINKLERS**A. Are all sprinklers free from corrosion, loading or obstruction to spray? X — —B. Are all sprinkler heads less than 50 years old? X — —C. Is stock of spare sprinklers available by the riser? X — —D. Is the exterior condition of the sprinkler system satisfactory? X — —E. Are sprinklers proper temperature ratings for their locations? X — —

Date	Test Pipe Location	Size Test Pipe	Static Pressure	Residual Pressure
9-28-03	Riser	1 1/2	165	180

(see back side of this sheet regarding comments on this system)

Explain any "No" answers and comments:

OK

Adjustments or corrections made during this inspection:

Although these comments are not the result of an engineering review, the following desirable improvements are recommended: